

April 21, 1958

NINTH ANNUAL AIR TRANSPORT PROGRESS ISSUE

Including

19th Edition, Air Transport Facts and Figures

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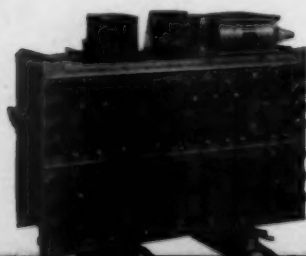
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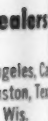
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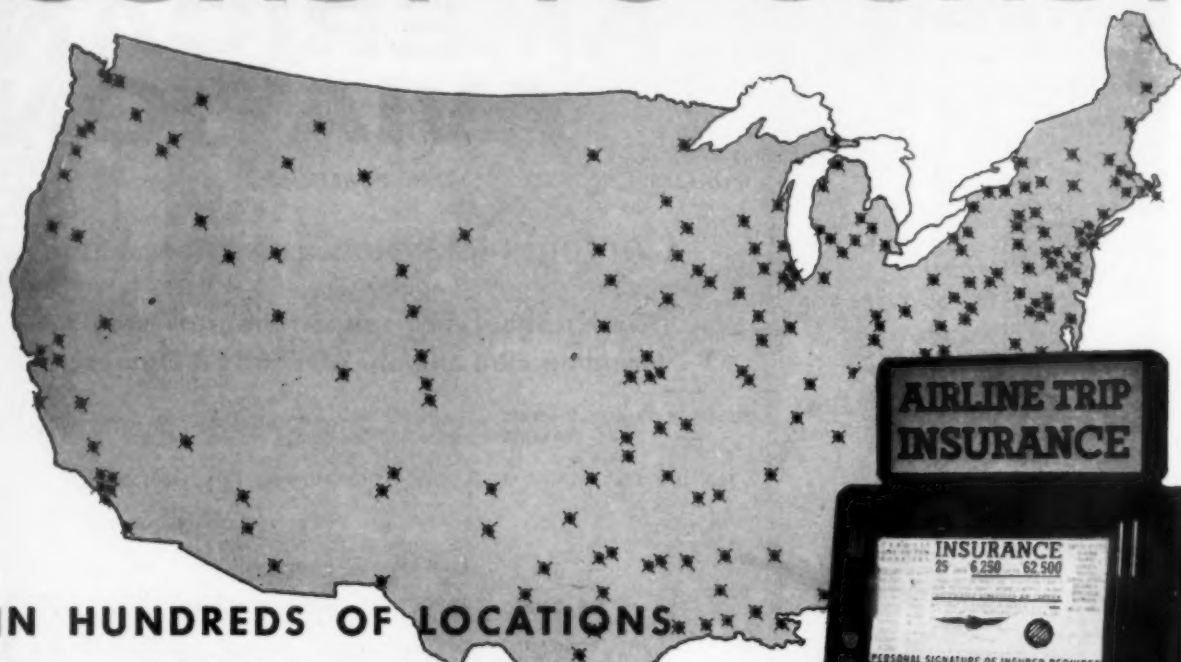
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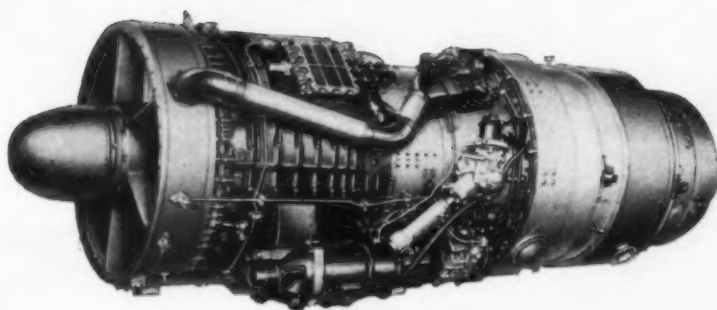


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This is it: Beginning a New Era

THIS IS THE YEAR.

This is the year that ushers in jet transportation for the United States with U.S.-built jets and turboprops. It is the beginning of a vast new era.

First on the turbine parade in mid-summer is the Fairchild F-27 turboprop. In autumn, the Boeing 707 jet and Lockheed Electra turboprop will make their debuts. Early next year it will be the Douglas DC-8, with the Convair 880 showing up at the year-end.

There will be at least one new British entry in this year's parade—the Viscount II. If financing plans are completed, there will be a second entry for domestic flights, the Britannia. Both are turboprops. And in the framework of prospects is the Comet IV, which rolled out recently at Hatfield.

The public will be captivated by jet transport with all of its many advantages. Flight times will be reduced even more sharply than is generally appreciated. New traffic markets will appear.

It is a period of equipment integration without parallel in air transport history. It is a period of vastly greater financial undertakings. And from the standpoint of airports, ground handling facilities and air traffic control, it is to be the greatest period of stress and strain the operators have ever known.

How then is industry preparing for the new era? Within this ninth annual AMERICAN AVIATION air transport progress issue, the reader will find many answers. At least he will find many approaches to the problems ahead. The pace of preparation has been quickened within the past year. There remains, however, a multitude of problems, especially passenger handling.

But the air transport industry itself is not in full control of its own destiny. More than perhaps in any other industry or activity, government is a controlling or a limiting factor. Government in this instance is a combination of federal, state and local units, although the dominant factor is federal.

Government leadership almost always lags behind the requirement. So it is that only now legislation is being drafted for a new Federal Aviation Agency which would not become effective, even at the most optimistic expectation, until late next year.

But even the new proposed agency will not have a substantive effect on the twenty-year-old Civil Aeronautics Board, which is to remain independent as an economic regulatory agency.

And here is the weakest link in the vital chain which must be strong if the U.S. enters into the jet

era smoothly. Not only is the CAB unprepared for a true understanding of the jet age, but its present construction makes it virtually impossible for the Board to comprehend the vastness of jet problems. The CAB was created in DC-3 days; it is still operating in a DC-3 climate. And it is possibly beyond the power of either the chairman or any of its members to alter this fact.

Whether by intent or by ignorance, the CAB has laid the groundwork for a smaller system of trunk airlines in the U.S. The coming of jets on top of the competitive route pattern established to date by CAB makes it certain that there will be fewer carriers. Although it has never established a public policy in this direction it has, by its own actions, doomed more than one regional carrier to eventual absorption by merger, and some of these mergers may be much closer than is generally realized.

Even in the local carrier field it seems certain that mergers will be forced by the unimaginative starvation policies of the Board.

Did the CAB plan it this way? We think not. But the agency's policies and decisions have paved the way for forced combines. And to an astonishing degree the Board's policies have been a deterrent rather than a boost to better service to intermediate cities.

The CAB is bogged down by a heavy docket backlog that embraces more than 1,220 applications on file, of which 484 are more than three years old. Some date back more than ten years. Faced with such a congested docket, it is small wonder that the CAB has been unable to explore the larger problems of air transport.

It is a source of real disappointment that Chairman Durfee, who has proved to be a hard-working and conscientious chairman, did not pick up the suggestion made some months ago by the Aviation Securities Committee of the Investment Bankers Association that the President appoint an individual of highest qualifications to undertake a complete review of the Civil Aeronautics Act and the CAB with the aim of presenting to the President and to Congress a concrete program for constructive action. It is true that the White House should have taken the lead, but it is equally true that Chairman Durfee could have increased his stature by endorsing the move and seeking White House support.

The jet age is almost here. It will be exciting. But it will strain the best resources of men and machines to bring it into being smoothly.

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WHEN—WHERE

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Flying Physicians Assn., spring cruise, Valley Ho Hotel, Scottsdale, Ariz., April 24-27.

ATA Facilitation Committee meeting, Miami Beach, Fla., April 29-May 1.

MAY

National Flight Test Instrumentation Symposium, Instrument Society of America, Park Sheraton Hotel, New York, May 4-7.

American Assn. of Airport Executives, annual business meeting and convention, Hacienda Motel, Fresno, Calif., May 4-7.

Annual Miami-Havana Air Cruise, sponsored by Florida Air Pilots Assn. (For details contact: J. G. Pace, 310 S.E. 2nd Ave., Miami), May 10-13.

IRE national conference on aeronautical electronics, Biltmore Hotel, Dayton, May 12-14.

Airport Operators Council, annual meeting, San Juan, Puerto Rico, May 12-16.

Armed Forces Day Dinner, Sheraton-Park Hotel, Washington, D.C., May 16. Observances in various cities, May 10-18.

Annual National Conference, Society of Aeronautical Weight Engineers, Inc., Belmont Plaza Hotel, New York, May 19-22.

National Fire Protection Assn., annual aviation fire safety seminar, Palmer House, Chicago, May 19-23.

Aircraft Industries Assn., board of governors meeting, Williamsburg, Va., May 21-23.

Aviation Writers Assn., annual convention, Shamrock Hilton Hotel, Houston, Tex., May 25-31.

JUNE

Armed Forces Communications & Electronics Assn., convention, Sheraton-Carlton Hotel, Washington, D.C., June 4-6.

Reading Aviation Service, annual maintenance and operations meeting, Municipal Airport, Reading, Pa., June 6-7.

Annual Skylady Derby (For details contact: Ruth Nickell, 904 Nickell Rd., Topeka, Kan.), June 12.

Air Mail Pioneers 40th Anniversary Ball, Beverly Hilton Hotel, Beverly Hills, Calif., June 14.

Aviation Distributors & Manufacturers Assn. annual meeting, Mount Washington Hotel, Bretton Woods, N.H., June 25-27.

AIEE transportation conference, Statler Hotel, Buffalo, N.Y., June 25-27.

JULY

All American Aviation Exposition, Allegheny County Airport, Pittsburgh, Pa., July 4-6.

Annual All-Woman Transcontinental Air Race, San Diego to Charleston, S.C., July 4-8. (For details write: Air Race, Inc., 2611 E. Spring St., Long Beach 6, Calif.)

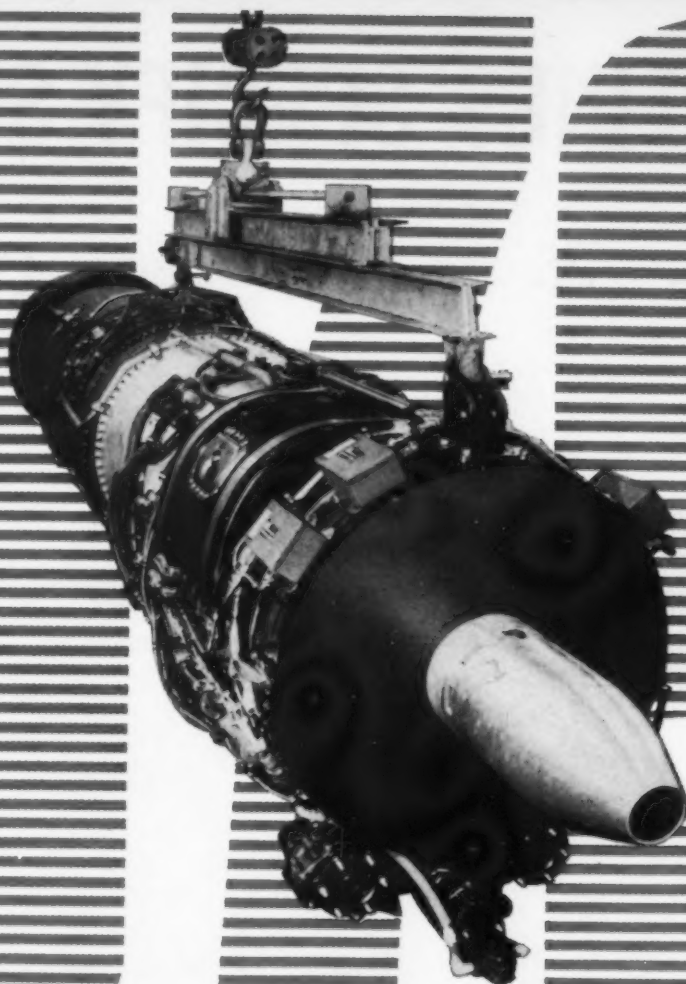
National Air Races, Royal Aero Club, Baginton Airport, Coventry, England, July 10-12.

Triennial inspection, NACA Ames Aeronautical Lab., Moffett Field, Calif., July 14-15.

Airline Electronics Engineering Committee meeting, Cosmopolitan Hotel, Denver, July 29-31.

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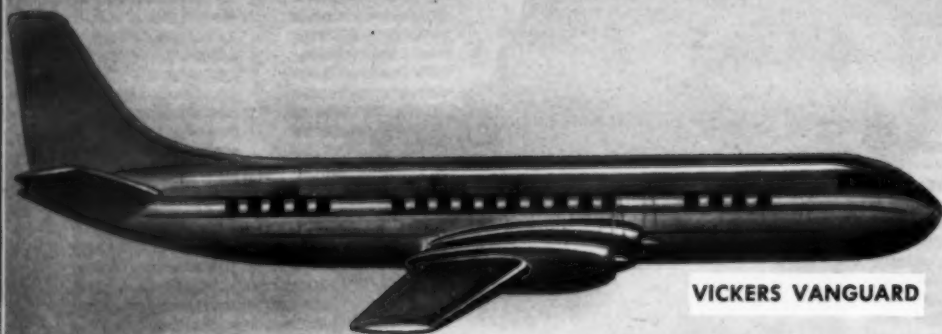
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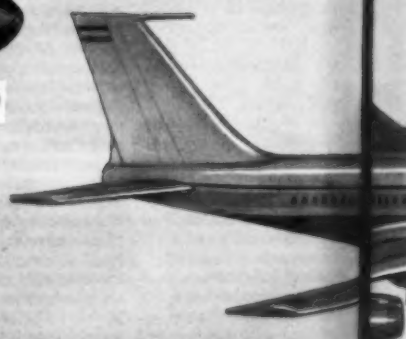
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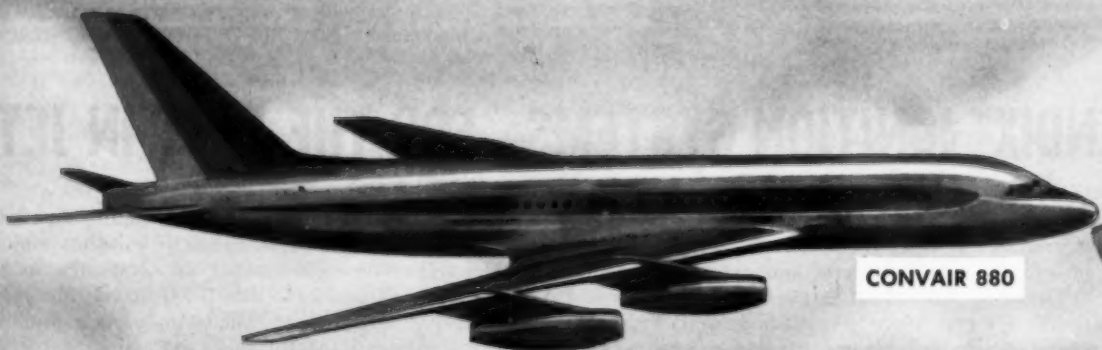
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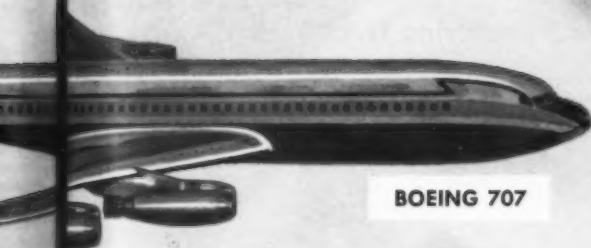
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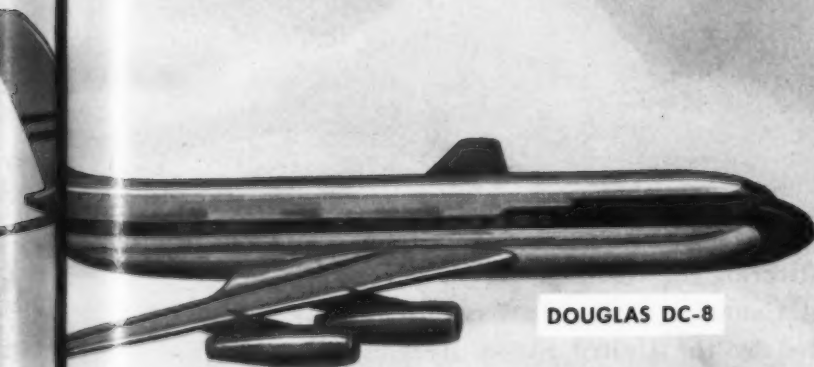
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EDWARD M. "BUD" FLESH, Senior Project Engineer of the F-101 Voodoo airplanes, has been in charge of the design and development of these Air Force fighters since their inception. Bud's abiding faith in his engineering team and in the Voodoo itself, has been a dominant influence toward the success of this project. A native son, graduate of Missouri University, he joined the McDonnell organization in 1946.

Range and reliability, two outstanding performance features of the F-101 Voodoo, were dramatically demonstrated during "Operation Sun Run," when three new transcontinental speed records were established. The world-wide acclaim of the Voodoo which followed was a fitting tribute to the many McDonnell teammates, engineers and others, who contributed their skills in creating and developing this fine airplane.

MEN OF PROJECT F-101

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SPOTLIGHT

Army's inventory of aircraft now stands at more than 4,700, including planes and helicopters. It expects to increase the total 50% by 1960.

Marine Corps interest in a tanker-transport version of Lockheed C-130B involves a potential order for 36 aircraft. As a Marine tanker, C-130B is proposed to carry 30,000 lbs. of fuel over a 1,000-nautical mile operating radius, would refuel aircraft inflight two-at-a-time at altitudes between 20,000 and 25,000 ft.

Fireworks are in store if CAA insists on going through with plans to decentralize engine type certification to its regions effective June 30. Engine manufacturers contend this will result in an expensive, two-step approval because regional personnel will not administer program on a self-sufficient basis. CAA decentralized this activity back in 1946 but recalled it to Washington headquarters in 1950.

Navy still isn't committed to a primary jet trainer as a permanent part of its program, although it now has 14 Temco TT-1s for evaluation in the primary phase. Plan is to "sample" a pilot group on TT-1s to determine whether this approach proves superior or whether to continue with piston-powered T-34 primary training.

Airways modernization item that recently raised eyebrows was assignment of two 1944-vintage VG-1 flat radar displays at Washington National Airport's ATC center.

Airline concern over skyrocketing fuel consumption in jet operations has spurred request for action by engine builders. Carriers are asking for a two-position idle setting for ground operation to produce better economy in event of delays between engine startup and takeoff.

Another jet fuel topic under active discussion concerns minimum dumping altitude for large quantities jets will handle. International Air Transport Assn. has voted to ask National Advisory Committee for Aeronautics to undertake flight test. Boeing 707 is capable of dumping 110,000 lbs. of fuel in 25 minutes. Vickers Armstrongs reports complete evaporation of kerosene dumped at 400 ft. above runway.

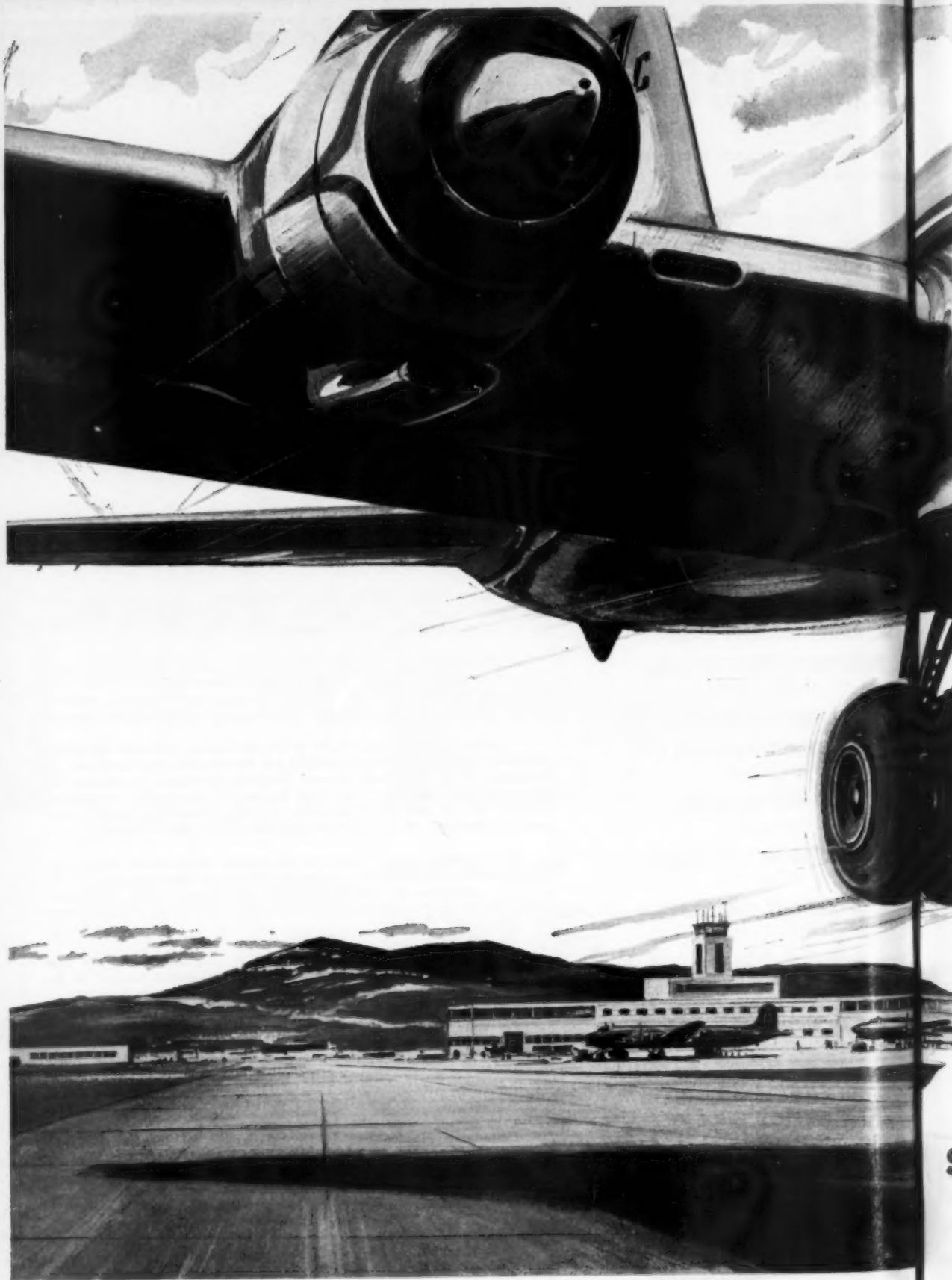
KLM, which has Lockheed turboprop Electras on order for short/medium stages, now is showing interest in Boeing's Model 720 turbojet development for similar-type operations. Fritz Besancon, executive vp of the Dutch airline, has been in Seattle checking into the lightweight turbojet.

Convair B-58's relatively small size is emphasized by fact that six of them can be housed in the same experimental hangar at Ft. Worth that formerly accommodated only two B-36s.

Designation for Grumman's new subsonic carrier-based Navy attack aircraft is the A2F. It is powered by Pratt & Whitney J52 engines. Company's new saucer-radome version of the TF1 is called the WF-2 Tracer. Grumman has a contract in excess of \$40 million for the latter, which is billed as a far-seeing early warning radar picket plane.

Canadair's Napier Eland-powered version of the Convair 440 will undergo certification tests in the U.S. Canada does not have its own certification setup, but accepts both CAA and Britain's Air Registration Board certificates.

First Morane-Saulnier MS-760 twin-jet business plane sold in this country will be delivered to Timken Roller Bearing Co., Camden, N. J., about mid-June. Plane will be disassembled at the French plant and shipped to Beech Aircraft, U.S. licensee, for reassembly at Wichita.





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2 Want flights to leave "when I want to go"

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Vibration-Free Flight—Quiet, no quiver—no shake. Passengers will remember this about Electra/Flight.

"Living Room" Comfort—Electra's wide fuselage allows new wider 20" seats...wider "room-to-pass" aisles. Large "picture windows" give a broad view. Radiant heated, fully pressurized air-conditioned cabin adds to passenger comfort. Interiors designed by Henry Dreyfuss.

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WEST COAST TALK

by Fred S. Hunter

Catalina's mountain-top airport is no place for Electra to practice landings

HERMAN SALMON, Lockheed's chief engineering test pilot, says the prop-jet Electra can be operated in and out of the Catalina Island airport.

"It would be no trick at all; I was over there looking the place over," Salmon said. "Don't bother to look it over any further," admonished Rudy L. Thoren, chief of flight test.

If you have ever landed on the carrier-type airport hewed out atop a mountain on Catalina, you'll understand what Rudy meant. Lockheed's test pilots have been doing some astonishing things with the Electra in short takeoffs and landings (as short as 900 feet at average landing weights), but they'll continue to do these things at Lockheed Air Terminal, not atop Catalina.

What's the actual cost of a jet airliner? Prices vary, depending upon engines and special features, but \$5 million has been the round number generally used in connection with such airplanes as the Boeing 707 and the Douglas DC-8.

Earlier this month when Douglas rolled the first DC-8 out at Long Beach it reported that the "airlines have committed more than \$675 million in orders for the jetliner."

Douglas has orders for 138 DC-8s. Divided into \$675 million, that comes to \$4,891,304 per airplane.

The Douglas DC-8 has four wing spoilers on each side but, unlike those on the Boeing 707, they are not operable in flight, nor are they used for lateral control. They are long narrow plates along the upper surface used for landing only. They pop up when the nose wheel hits, increasing the weight on the nose wheel for quicker stops and shorter landing runs. The DC-8 uses split ailerons for lateral control. The inboards are active at high air speeds with a torsion bar linkage permitting the outer ailerons to operate in unison at low air speeds.

Douglas, incidentally, is working on a design whereby a spare DC-8 engine could be carried as an external store. If Pan American, for example, should have an engine go out at a remote point such as Guam, it could attach the external store to the next regularly scheduled flight for airlift of a replacement from Honolulu, San Francisco or wherever spare engines might be stored. With jet engines costing from \$145,000 up, any system reducing the investment in spares would be a welcome economy to operators. Douglas

has a lot of external stores know-how gleaned from extensive developments along this line for the military.

Pan American's Pacific-Alaska Division is seeking CAA approval to use interrogated weights (ask the passenger how much he weighs) on flights rather than the standard weight (160 pounds) now used. Pan Am says exact weights often would permit it to put more passengers aboard. The carrier came to this conclusion after a seven-day survey conducted at San Francisco and Hong Kong to determine the actual weight of the passengers flying on its airplanes. It found it could get more people aboard when the space was available.

Bonanza Air Lines, which upped its Fairchild F-27 order from three firm and three on option to six firm and six on option, is also waiting for the larger Dart engines to become available. This means BAL will get its first airplane in December instead of July or August. BAL discovered that the smaller engines would not provide sufficient performance for some of the airports, altitudes and temperatures encountered on its routes.

International carriers operating at the Los Angeles International Airport may have to accept the satellite system setup for the new terminal complex, but they won't like it. The airport plans to establish customs, immigration and public service within the satellite (one of six) to be established to handle international flights. The carriers want a separate customs facility located on the street. If customs is in the satellite it means a double baggage-handling job on incoming flights, first from plane to customs, then from customs to the street. Some of the local service carriers, such as Bonanza and Los Angeles Airways, also say the split-level satellite design would impose excessive costs on their operations.

You can look for new jet airliners with combination interiors to be heavy on the economy side. Trans-Canada, for example, is said to be contemplating a 150-passenger DC-8 cabin with a forward lounge for 30 standard-fare passengers and 120 economy-fare passengers in the main cabin.

Los Angeles sports writers, who covered the spring training activities of the Dodgers, said they found it more involved flying from Los Angeles and Florida than to Europe.

THE RECORD-BREAKING VISCOUNT



VISCOUNTS HELP CAPITAL RISE TO #5 POSITION

Logging a record 35.9% increase in passengers carried and 56.9% in revenue passenger miles, Capital Airlines has risen from 7th to 5th place among U.S. domestic carriers. Figures for the first half of 1957 versus 1956 show that Capital, with a passenger gain of 492,447, raised its share of the total passenger market from 7.5% to 9.5%. The major portion of Capital's fleet consists of jet-prop Viscounts.



HAVANA MAN WISHES ALL PLANES WERE VISCOUNTS!

Cubana Airlines recently received a letter containing a rather unique kind of praise for their Viscount fleet. The sender was not a passenger! He thanked the airline for "adoption of the Viscount which creates less noise in take-off and spends less time in getting over the homes than their competitors". PS: The gentleman should know what he's talking about . . . he lives very near the busy Havana airport.

HIGH RATIO OF REORDERS PROVES VISCOUNTS ARE FINANCIAL SUCCESS

Proof that the jet-prop Vickers Viscount is an exceptionally potent money-maker lies in the uncommonly high ratio of reorders for the aircraft. Of the 18 original operators, 12 have increased their initial orders. BEA raised its first order of 20 to 65—with an option of 12 more. TCA's order jumped from 15 to 51. And TAA has reordered three times!



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Because of its well balanced passenger/freight ratio, the great new jet-prop Vanguard offers operators exceptional passenger and/or freight flexibility.

The upper deck passenger cabin can accommodate up to 139 in complete comfort. The Vanguard's extra-wide fuselage, great length and removable bulkheads allow amazing flexibility of configuration. The lower deck contains two big cargo holds with an overall 1360 cubic foot capacity—ample for carrying up to 10 tons of payload at normal densities. Thus, with no alterations, the Vanguard can operate round the clock and throughout the year more profitably than any other airliner in production.

420 mph plus . . . 2500-mile range . . . up to 139 passengers . . . up to 10 tons of freight

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The Vanguard will greatly reduce routing problems. It has no take-off difficulties and the Vanguard can be operated out of almost any of today's trunk line airports—and even some secondary ones. It will be economically suited to routes from 200 to 2500 miles. In fact, extensive studies reveal that the Vanguard will have a break-even load factor *below 50%* on all stages up to 2500 miles.

Detailed information on the Vanguard and how its remarkable flexibility can benefit your operations is available now from an experienced Vickers engineering team. For a visit, at your convenience, call or write: Christopher Clarkson, U.S. representative, 10 Rockefeller Plaza, New York 20, N.Y.

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by HERB FISHER, international aviation authority, veteran test pilot, author



Herbert O. Fisher

Backbone of civil aviation's growth to 100,000 aircraft — a 400 per cent increase in 15 years — is "strictly business... business before pleasure."

Of civil aviation's *private* flying fleet alone, which is 44 times larger than the 1,500-plane scheduled airline fleet, some 25,000 aircraft are "flying conference rooms," *winged couriers of industry*.



Down to earth... Mike Murphy, Co-pilot Dick Owens (l/r) chart route to Guatemala.

Business flying is big business, expanding at a rate far outstripping that of commercial and pleasure flying. With one factory in three located in a small town off commercial air routes, business fleets are more than paying their way.

I've found few firms with business fleets and aviation departments comparable in size, scope and efficiency

to that of the Ohio Oil Company.

This company — with world-wide operations embracing exploration and production, supply and transportation, refining and marketing — is a natural for business flying. The

14th largest domestic crude oil producer among 12,000 concerns, Ohio Oil must integrate by fast flight a scattered domestic operation ranging from Texas to Canada, and a



Rugged duty... Champion-equipped Tri-Pacer flies Illinois pipeline patrol.

foreign exploration program stretching to remote corners of the earth.

Ohio Oil operates 23 aircraft, has 32 full-time pilots and co-pilots, nine skilled mechanics, and owns and maintains a modern airport at Findlay, Ohio, equipped to handle all types of aircraft; runways alone compare with the longest in the U.S.

Heading the company's 48 member Aviation Department is an old friend of mine from barnstorming days — one Michael Murphy, dean of old-time stunt men, a decorated precision pilot and an aviation legend. Mike set up Ohio Oil's Aviation Department in 1945, after an Air Force career as lieutenant colonel in charge of glider fleets for General "Hap" Arnold.

Few U.S. corporations own and operate an airport with such complete hangar and shop facilities for maintenance, overhaul, and even conversion of its varied aircraft, as does Ohio Oil. And in every detail, this operation is efficiency at its best.

"Management wants nothing but the very finest care given their planes aloft as well as on the ground," Mike told me. "We're directed to use only the very best in parts and equipment — thoroughly tested by us to meet our top standards for maximum safe performance in all operating extremes."

"That's why we've used Champion Spark Plugs, for example, for 10 years. We've found them tops in performance and dependability."

Ohio Oil aircraft, too, are selected for specific jobs — Super Ventura, DC-3's and C-47's for long hauls to far-flung points not serviced by

Days away, once... Remote oil field is but few hours from Findlay headquarters via Champion-fired Bonanza business craft.



In good hands... Skilled technician assures peak performance of Pratt & Whitney R-985 Super Beech engine with dependable Champions.



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Top men, top assignment, top equipment . . . "Amazing what the right spark plug can do," Mike Murphy (c) tells Ass't Aviation Mgr. Earl Bauer, Ventura Pilot Dick Yookam (l/r), and Co-pilot-Mechanic Mac Powell (rear). Ohio Oil experimented with other spark plugs through the years, always returned to Champions.

airlines, or for large groups wishing to hold conferences en route; Piper Tri-Pacers for pipeline patrol; Twin Beeches, a Twin Bonanza, a Travelair and Bonanzas for heavier loads and feeder service to airline terminals; DeHavilland Beavers and Cessnas for general duty.

"With our world-wide operation, traveling itself could be a full-time occupation for many of our personnel if we didn't have our own air fleet," Mike said. "Management indicates that, without a business fleet, we would need considerably more high-salaried specialists and executives -- and these are hard to come by. It's difficult to estimate the monetary value of increased production hours resulting from tremendously reduced travel hours."

A case in point: For Ohio Oil executives to get in one day's work at the company's Robinson, Ill., refinery, two days are spent in round-trip land travel. Champion-fired business aircraft, however, provide three-hour round-trip commuter service, enabling one man to compress three days in one.

"We're not competing with the



New feathers for old eagles . . . Veteran pilots like Tom McFarland get constant refresher training in new equipment and procedures. Link operator is Pilot Dick Carpenter.

airlines," Mike said. "Actually, we bring them to our front door. We shuttle our executives to commercial terminals when they're en route to destinations served by airlines."

Aerial pipeline patrol certainly pays for itself, too, Mike told me. A Tri-Pacer pilot covers in one day 550 miles of Ohio Oil's 3,300-mile pipeline system. Walking inspectors cover but 10 miles a day.

This daily flying at extremely low altitudes calls for intense pilot con-

centration -- split-second attention to various details of plane performance, terrain, turbulence. The pilot can take no chances of engine failure. Such rugged duty makes it mandatory, then, that the vital heart of the pipeline patrol plane be fired to life day after day by Champions.

Ohio Oil maintains small airports in remote exploration areas of South America and Africa. At Ohio Oil's Oasis Oil Co. of Libya, for example, a C-47, Beaver and Cessna carry supplies and personnel into regions previously accessible only by many days of camel caravan.

Here, too, Champions assure safe flight over trackless wilds, where engine trouble far from an airport might mean the end . . .

At Findlay headquarters I saw flight crews -- all in white dress shirts -- handling passenger baggage,



Fast, flexible . . . Egyptian C-47 and helicopter help solve time, distance problems -- mandatory for integrating and supplying Ohio Oil's far-flung foreign operations.

gassing planes, doing administrative work, getting weather reports, mapping precise routes over back country, doing custodial work in plane interiors, checking and ordering replacement parts, performing as all-around mechanics, designing their own executive plane interior equipment, sewing fabric and doing carpentry on interior woodwork installations -- literally doing *everything* themselves -- plus flying.

"You'd have to screen thousands of pilots and mechanics to find any as qualified as ours," Mike told me. "Our men must be specialists in not one field but several."

It's a real tribute to Mike's management and experience -- along with the performance of pilots, maintenance crews and aircraft equipment, such as Champions -- for Ohio Oil to have been honored by the N.B.A.A. for a perfect safety record . . . 33,000,000 accident-free passenger miles.

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LETTERS

CAB remains independent

To the Editor:

I have read with great interest your editorial "Coming: A New Federal Aviation Agency," that appeared in the March 24, 1958, issue of *AMERICAN AVIATION*. Your appreciation of our efforts to implement the recommendations of the Curtis report is indeed timely, and I hope will continue.

Basically, we are preparing a program of organization and draft legislation which will lead to a Federal Aviation Agency as outlined in the Curtis report, and as required by Sec. 7 of PL 85-133, which reads as follows:

"It is the sense of the Congress that on or before January 15, 1959, a program of reorganization establishing an independent aviation authority, following the objectives and conclusions of the Curtis report of May 14, 1957, entitled 'Aviation Facilities Planning,' be submitted to the Congress."

In this effort we are now trying to develop an organization into which are consolidated all the essential management functions necessary to support the common needs of civil and military aviation in the United States. Our task is indeed a formidable one and involves many areas of our government and industry.

Although the Curtis report recommends transfer of the function of accident investigation and the promulgation of Civil Air Regulations from the Civil Aeronautics Board to the Federal Aviation Agency, it refrains from recommending transfer of the Board's economic regulatory function.

It follows, therefore, that no consideration is being given to including the Civil Aeronautics Board within the Federal Aviation Agency.

I offer this to clarify a point that has often been confused. *E. R. QUE-SADA*, Special Assistant to the President.

EDITOR'S NOTE: We were wrong about transferring CAB as noted in correction on editorial page in April 7 issue. Sorry.

Most valuable handbook

To the Editor:

Please accept my somewhat belated compliments and appreciation for the First Annual Army Aviation Issue of *AMERICAN AVIATION*. This excellent issue provides a most valuable handbook on the subject and as complete and informative discussion of it as I have yet seen.

H. P. STORKE, Major General, Chief of Information, Department of the Army, Washington, D.C.

Empire-builders' problems

To the Editor:

Apparently our civilian counterparts feel that they can do everything better than the military. Any bidders to provide a fighting department?

Criticism of the military is certainly the prerogative of all civilians. I take exception, however, to the last paragraph of the editorial which I have inclosed. All ranks, both officers and enlisted, do their very best to uphold the constitution of the United States against all enemies both foreign and domestic; to carry out the intent of Congress, and to be individuals of which the country and the

individual services can be proud. Criticism of this type is, to even the most broad-minded person, not constructive.

May I suggest that a qualified representative of the *AMERICAN AVIATION* editorial staff check with responsible officers in the Pentagon to ascertain why projects are following the present trend? The military, too, has its problems.

WILLIAM W. O'NEILL, JR., Major, USAF.

EDITOR'S NOTE: Criticism of military empire-building is constructive if its aim is to eliminate practices destructive of our basic social and economic structure. Let the military indeed carry out the intent of Congress; this might be refreshing in the aircraft maintenance and overhaul field.

Pilot's reaction to ATC 'progress'

To the Editor:

I was much gratified to see Sam Saint's article, "Air Traffic Control Di-

lemma—Progress or Confusion?" (*AMERICAN AVIATION*, December 2, 1957, p. 29.)

I have sent his column to my congressman.

When you have time, how about a counter-attack on the "Attack of Progress" in the modern airline transports, especially in the cockpits, e.g., pilot seats located awkwardly with relation to flight controls and to visibility; an "all electrical" fad even though it takes longer; three switches to turn on one light, etc.

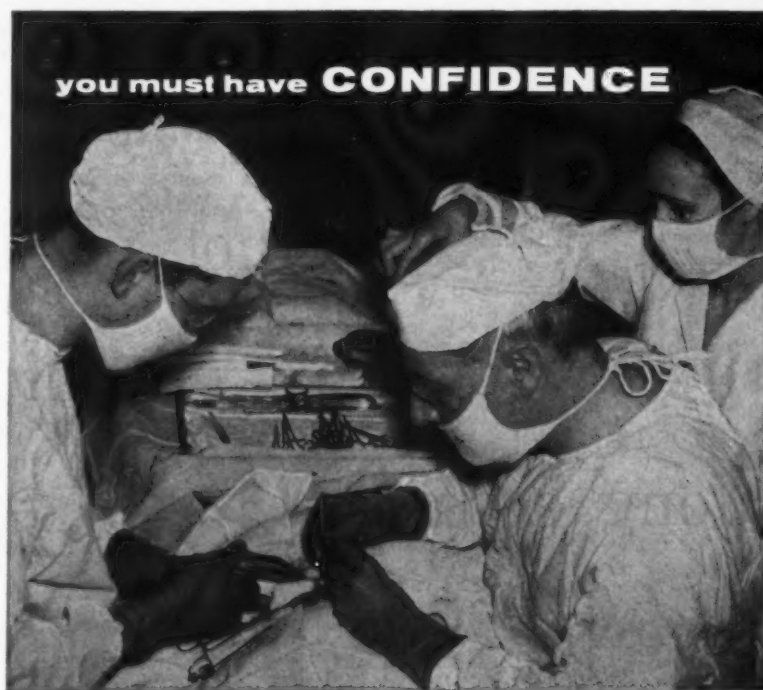
H. M. HOLDEN, JR., pilot, New York City.

Air traffic dodge?

To the Editor:

Regarding Sam Saint's articles on air traffic control, as an interested bystander in this matter of ATC, it seems to me that all parties (AMB, CAA, ALPA, ATA, etc.) seem to effectively dodge the basic philosophical issue which is: under what conditions does anyone other than the pilot need to know where the aircraft now is?

I am convinced that we will never get to first base with a solution to this problem until such philosophical princi-



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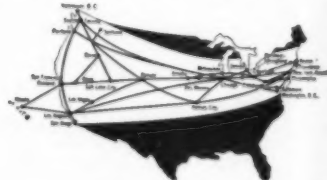
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AMERICAN AVIATION

ples are established—no fruit will be brought forth until we provide a healthy root structure. **DON McCANN**, No. Reading, Mass.

Add applause for March 24 issue

To the Editor:

Just a line to let you know we at Vickers enjoyed the March 24 **AMERICAN AVIATION** story about our Torrance plant. Mr. Van Osten, your West Coast reporter, did a nice job.

In the same issue, incidentally, I noticed particularly the "Accessory Report . . . Turbine Transports." It's not always easy to gather such a complete run-down on new aircraft. Usually charts of this sort begin to appear, in parts, after the aircraft have been in service for many months.

There is a question evident in the chart as I'm sure you know. Here are five new aircraft. In many cases specific equipment could be standard for all (except possibly for sizes). For the airlines this could mean significantly reduced maintenance in stores, tooling and training costs where more than one aircraft type is to be placed in airlines service. To combat this thought is the possibility of excluding an outstanding new approach to some system proposed by the forward-thinking airframe designer.

The airframes standardize on some systems that seem best for them. Pricing this installation across their anticipated aircraft production run contributes "x" value to the airplane price. If an airline wants an installation other than the standard, the cost then is quite high because of the special handling required. I've often wondered if anyone has ever thoroughly evaluated the cost of fleet equipment non-

standardization versus the cost to change original installation equipment at the factory. There should be an interesting formula for this.

The last item then is "People." I'd like to vote in favor of the method of presentation in the March 24 issue as opposed to the more open columnized layout in earlier issues. There may be a third and better way of presenting this information but of the two used, I find the latest method reads more quickly. **W. L. FLINN**, Staff Director, Defense Activities, Vickers, Inc., Division of Sperry Rand Corp., Detroit, Mich.

Liked Van Osten's story

To the Editor:

I just read the Vickers West Coast article by Richard Van Osten which appeared in the 24 March issue of **AMERICAN AVIATION**. I wish to compliment you on the fine job, and express my appreciation for your cooperation in presenting the Torrance plant picture.

I had heard many fine comments on the article prior to seeing it today. I was afraid, after the comments, that I would find it less interesting when I read it. Such, however, was not the case. I thoroughly enjoyed the article, and believe your handling was well done. **ROBERT E. GODFREY**, Vickers, Inc., Torrance, Calif.

On jet overhaul

To the Editor:

I was interested to see on page 14, your issue of March 24, that the fact that the J57 turbojet engine has reached the

1,000-hour overhaul point in seven years is considered exceptional.

May I point out that, as a result of the intensive development devoted to it prior to its entry into service in February 1957, the Bristol Proteus 705 turboprop used in the Bristol Britannia reached the 1,000-hour overhaul point in just over seven months.

The overhaul life of this engine has now been raised to 1,300 hours less than 14 months after its entry into commercial service. **D. H. WHALEY**, Bristol Aero-Engines Ltd., Bristol, England.

Explanation of LORAN

To the Editor:

In the March 24 issue of **AMERICAN AVIATION**, there appeared a letter written by a Mr. T. D. Johnson criticising the article on LORAN by Mr. H. P. Steier, which appeared in the previous issue.

Apparently, Mr. Johnson does not know what LORAN is. LORAN is a **LONG RANGE** aid to Navigation. The daytime range is approximately 750 miles and 1,500 miles at night. It was never intended to be used as a short-range aid in congested terminal areas.

LORAN coverage is quite complete over most of the over-water airline routes, as was indicated in the LORAN article. If Mr. Johnson will check with many of the airlines flying these routes, he will find that they regularly use LORAN, and have been for many years, as a long range navigational aid.

If he doubts that LORAN provides adequate coverage in the North Atlantic, I suggest that he purchase the LORAN Chart, LS-103, 3rd edition, revised in



Faster Flights on **TTA**...



with the most advanced fleet of its type

TRANS-TEXAS AIRWAYS again pioneers better service . . . with a new "Maximizer" modification that boosts plane speed, increases engine efficiency and achieves smoother flights.

With the completion of the new modification on all TTA planes in mid-year,

Trans-Texas will be the first airline to offer these new high-performance features on all flights!

Passengers get the finest service in the Southwest when you schedule connections by Trans-Texas Airways.

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April 1956, which is published by the USAF Aeronautical Chart and Information Center, St. Louis, Mo. This chart shows the coverage in the North Atlantic, including the Azores and Lisbon. In fact, LORAN coverage extends far beyond what is indicated on this chart. There are commercial airliners flying from Africa to South America that use LORAN fixes obtained from stations in the North Atlantic.

It appears that LORAN, the *Long Range* aid to Navigation that has been with us since World War II, is still with us today and will still be here tomorrow with ever-increasing coverage and improvements. This is evidenced by the fact that many of the international overseas airlines have specified EDO LORAN for

their new jet transports. *E. H. THEILMANN*, manager, *Electronic Sales, EDO Corp.*, College Point 56, New York.

EDITOR'S NOTE: Next round, Mr. Johnson and Decca, Dectra.

Praises article on windtunnels

To the Editor:

The article "Where We Stand on Windtunnels" by Richard van Osten, which appeared in a recent issue of *AMERICAN AVIATION*, is a very well written review of present windtunnels and equipment. In this article, Mr. van Osten has done an excellent job of achieving reader appeal while stating technical facts in a way which does not degrade those facts. This feat is certainly difficult to

accomplish and is worthy of note. *W. DANIELS, JR.*, Section Head, *Aero-Thermo Lab.*, North American Aviation, Inc., Los Angeles, California.

March 10 issue in demand

To the Editor:

Your March 10 edition of *AMERICAN AVIATION* has been so much in demand that we need an additional copy or two. It is a most comprehensive piece of journalism.

At your earliest convenience please send two more copies of the issue and the bill to the attention of the writer, *G. JACKSON BUTTERBAUGH*, Bell Helicopter Corp., Fort Worth, Tex.

Reprints wanted

To the Editor:

We would appreciate very much having reprints of the following articles from the March 10 issue of *AMERICAN AVIATION*: *Who's Who in Army Aviation*, p. 22-25; *How to do business with the Army*; a guide for contractors, p. 81-84. *MRS. FRANCES HENDERSON*, Apparatus Div. Library, Texas Instruments Inc., Dallas, Tex.

We're 'comprehensive, informative'

To the Editor:

Please accept my congratulations on an outstanding issue of *AMERICAN AVIATION*—that on Aircraft Systems and Accessories, March 24. This coverage of the subject was both comprehensive and unusually informative, even to one quite close to the accessory business.

We particularly appreciate the excellent articles covering the work done in our Torrance, Calif. plant and on our miniature vane pump. Your coverage of the subjects was most complete.

This type of issue is certainly beneficial to the aircraft accessory industry in pointing up what the industry contributes, its problems and its future potential. Our thanks for a first-class job. *B. W. BADENOCH*, Vickers Incorporated, Detroit, Mich.

CAA wants tearsheets

To the Editor:

We have read with keen interest the "Accessory Report—U.S. Turbine Transports," an article that appeared in the March 24, 1958 issue of *AMERICAN AVIATION*.

It would be appreciated if you could send us twelve copies of tear sheets for pages 24, 25, 28 and 29 covering the aircraft systems and accessories supplement. *L. E. SHEDENHELM*, Chief, Aircraft Branch, CAA, Oklahoma City, Okla.

More about accessories

To the Editor:

In your March 24 issue of *AMERICAN AVIATION* you published an article covering our Torrance (Calif.) plant operations. This article was enjoyable to us and I feel sure it will also be beneficial. I wish to express appreciation for our local group. *BERT L. STONE*, California operations mgr., Vickers Incorporated.

Blast for Weather Bureau

To the Editor:

Have read your editorial in the Jan. 27 issue "Florida—Somebody Needs to Do Some Blasting." To whom can your readers forward some dynamite? *CALVIN G. RANKIN*, Coral Gables, Fla.



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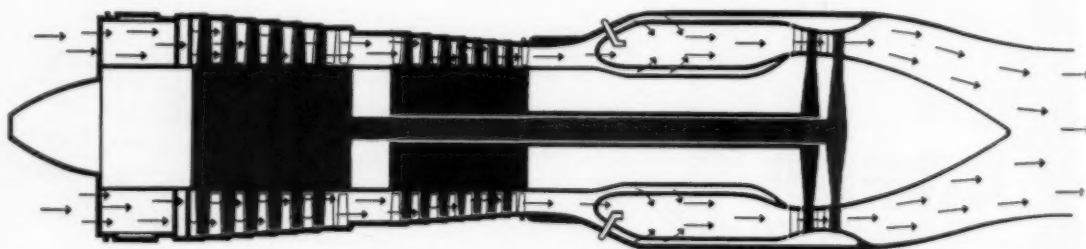
BRISTOL: Power for the Wings of the World—No. 4

BRISTOL OLYMPUS

POWERS THE

VULCAN

**Twin-spool Olympus gives British V bombers
great speed, high ceiling, long range**



Gas-flow diagram of Bristol Olympus, illustrating twin-spool principle
Low pressure system in light gray, high pressure system in dark gray

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The great Avro Vulcans of the British Royal Air Force are powered by Bristol Olympus turbojets. These V bombers owe their great speed, high ceiling and long range largely to the Olympus—an engine which uniquely combines great power at high altitudes, very low specific fuel consumption, and exceptional, proven reliability.

The British Under-Secretary of State for Air, Mr Charles L. Orr-Ewing, has stated: "The Vulcan has probably had the minimum amount of teething trouble of any aircraft introduced in the RAF over the last 10 years."

Bristol twin-spool system. The Olympus employs the Bristol-pioneered twin-spool system. This system makes starting easy, eliminates surge, and gives a rapid response to control. Vulcan pilots regularly put the Olympus through "slam" accelerations and decelerations at altitudes well above 50,000 ft—one of the most severe tests to which a turbojet can be subjected. The Olympus responds magnificently every time.

Latest version—the Bristol Olympus Mark 200 is type tested at 16,000-lb thrust—without reheat. It is now in production for the Vulcan B Mark 2 and gives the bomber even better performance. A civil version of this turbojet—the Wright TJ 38 Zephyr—has been jointly developed by Bristol and Curtiss-Wright.

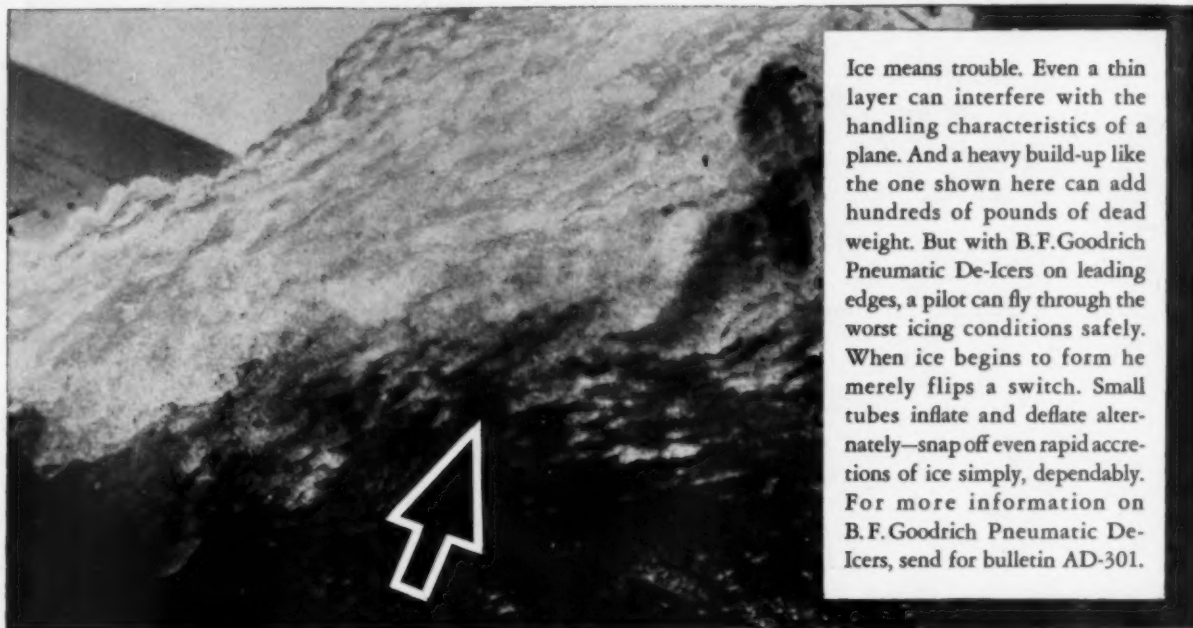
Olympus development. The Olympus is capable of development into the 20,000-lb thrust class. It has already run at observed thrusts of over 17,300 lb without reheat.

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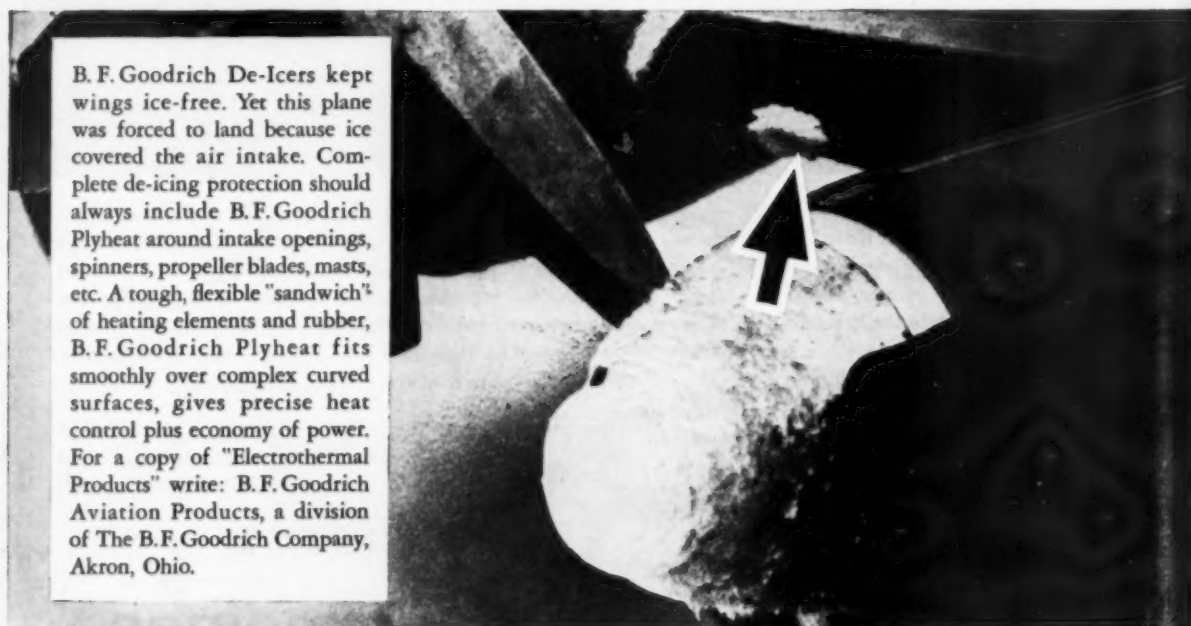
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Celebration or wake?

*Industry greets 20th anniversary of Civil Aeronautics Act
in shroud of gloom on jet threshold*

A Staff Analysis

THE QUESTION in this 20th anniversary year of controlled development of commercial aviation in the United States is whether there should be a celebration or a wake. The government itself plans to celebrate—this being the 20th birthyear of the Civil Aeronautics Act—but the festivities will be clouded by Congressional consideration early next year of a new form of federal regulation for aviation.

For the airlines, it is necessary to go back to the airline depression years following World War II to find a year as unprofitable as 1957. Net operating income—the difference between revenues and expenses—dropped almost \$60 million to an eight-year low of \$41 million. After taxes and interest, net profit was \$26.5 million, the lowest since 1949.

There would be no profits in 1958 if the Civil Aeronautics Board hadn't granted an emergency fare increase early this year. As a result, instead of red ink, the carriers estimate a net

profit after taxes and interest this year of \$44.8 million.

While more palatable than last year's tailspin, you have to go back to 1951 to find an equivalent profit figure—all since then, except 1957, being much higher. And total business done by the airlines in 1951 was less than half that contemplated in 1958.

It is this gloomy picture on the doorstep of the jet age that adds impetus to the plans of Congress next year. Interest will be focused on the 20-year transition of the Civil Aeronautics Act of 1938 from a successful legislative stimulant for aviation to an apparent anchor on the jet age to be launched in about six months.

Vehicle for Congressional action will be the recommendation for a new Federal Aviation Agency made last year by Edward P. Curtis, then Special Assistant to President Eisenhower on aviation matters. If the Curtis recommendation is adopted by Congress, the CAB staff will be revamped and what

remains will be a shell of the present organization limited to route and rate functions of the five-man Board.

The new agency, FAA, will absorb the sprawling Civil Aeronautics Administration (now a part of the Commerce Dept.), the new Airways Modernization Board, CAB's safety regulation and safety investigation functions and, in short, will centralize more than 90% of federal aviation activities, including commercial and nontactical military matters, in one agency.

Perhaps it's the march of time, but the FAA would thus supplant the very agency (CAB) which was designed 20 years ago as the ultimate in a centralized agency for the fast-growing aviation business. And perhaps it is symbolic of the fast pace today that even before Congress considers legislation to establish FAA, President Eisenhower has asked for a new "space" agency which shortly could be the ultimate in a centralized aeronautical body.

But if the CAB is to be replaced

What lies ahead for domestic trunks . . . A five-year forecast

(all figures in millions)

	1957 actual	1958	1959	1960	1961	1962
Passenger-miles	24,499	28,591	31,473	35,252	40,431	42,889
Available seat-miles	39,838	46,428	50,678	57,726	67,005	69,521
Total revenues	\$1,419	\$1,632	\$1,916	\$2,124	\$2,419	\$2,551
Total operating expenses	\$1,377	\$1,568	\$1,805	\$2,012	\$2,262	\$2,346
Operating income	\$ 42	\$ 64	\$ 111	\$ 112	\$ 157	\$ 205

Note: Forecast is based largely on exhibits filed in CAB's General Passenger Fare Investigation. Figures for 1958 are actually as forecast by the carriers. Figures from 1959 on include projections, since all carriers did not complete forecasts beyond 1958.

Major problem areas

- Increased user charges
- Inadequate fare level
- Used aircraft market
- Business recession
- Rising costs

next year by FAA, it will be on the theory that technological advances of the industry are of such frequency and magnitude as to render the cumbersome procedures of a five-man quasi-judicial board inadequate.

Actually, with the exception of the stranglehold on the airline industry that these cumbersome procedures have produced, the government is seemingly going all-out for the jet age. Extensive national plans and policies for Federal aid to and the development of jet airports and jet airways are under way. The total outlay of funds for those over the past 20 years far exceeds the total amount of subsidy advanced by CAB to the U.S. airlines.

In the fiscal year beginning July 1, 1958, the Civil Aeronautics Administration, through the Dept. of Commerce, will spend at least \$63.5 million in matching funds for jet age airport development. It will cap a four-year plan in which total CAA expenditures on airports will exceed \$250 million.

Congress may add \$75 million

A bill pending in Congress would add another \$75 million in the coming fiscal year and extend the program for four more years at a new high rate of \$100 million annually. This would bring the total airport outlay by the Federal government to about three-quarters of a billion dollars for an eight-year period through fiscal 1963.

Even that amount is dwarfed by the CAA's Federal Airways Plan for the 1957-1962 period which contemplates \$2.5 billion for installation, maintenance and operation of air navigation facilities.

Add to such expenditures the matching airport funds of the communities and the minimum \$2.5 billion commitment for jet aircraft of the airlines and the nation seems well on its way to assuring the United States of the No. 1 role in the world for the jet age.

But somewhere far behind and threatening the entire investment is the CAB, its 20-year-old act, its century-old rate concepts, and its unprecedented theories on competition. It is this picture that is lending added support to the Curtis recommendation for a new central aviation agency.

No longer can needed advances and actions in the industry await the three and four years necessary for a CAB decision. No longer are petty arguments on airline fares, such as were raised in 1956 by the House Antitrust Subcommittee, of any import. What CAB will now have to answer to Congress for will be the reasons why our airline industry was permitted to flounder perilously close to collapse at a time when it should have been forging ahead at a pace previously unexcelled.

The airline industry, of course, is far from dying and, given the necessary tools, will secure its place in the jet age. But the problems facing it at this point—and not all are traceable to CAB—render the situation among the most

Fare increase . . . it's only a palliative

In late January this year, CAB granted the airlines what Vice Chairman Chan Gurney termed a "temporary palliative." It was a fare increase of 4% plus \$1 per ticket. Gurney favored a 10% increase plus \$1 per ticket. The airlines are asking increases of from 12% to 17% but those requests are mired in the marathon General Passenger Fare Investigation now not expected to be decided until early 1959.

It would be unfair to CAB to say it is unaware of the industry's plight for adequate fare relief. The three

members—Chairman James R. Durfee, and Members Harmar D. Denny and Louis J. Hector—noted in granting the recent 4% increase that similar action could be taken in the future without waiting for conclusion of the investigation.

Unfortunately, it was the absence of a similar view a year ago at this time when the airlines asked an emergency 6% fare boost, that cost the airlines an estimated \$38 million in revenues which otherwise would have been available. CAB denied that bid, although Gurney favored approval.

critical in U.S. aviation history:

Perhaps the most serious problem facing the industry involves the disposition between now and the end of 1961 of some 551 four-engine and twin-engine aircraft in a used airplane market so badly deflated that those that can sell planes will be fortunate to recover residual values.

This is directly related to the replacement program under which the airlines will insert some 400 pure jet and prop-jet aircraft into their operations over the next three or four years.

American Airlines anticipates its entire Douglas DC-7 fleet will be superseded by jet equipment no later than the end of 1961. United Air Lines plans to start retiring DC-7s early in 1960 and will have retired 36 of its fleet of 56 DC-7s by the end of 1961.

Other models to be retired

In all, it is estimated there will be 326 DC-7s and 163 long-range Lockheed Constellations on the market within the next few years. In addition, other models will be retired. National Airlines plans on retiring in 1959 some 24 aircraft, consisting of four DC-6s, eight DC-6Bs and twelve Convair 340s.

Ominously in the background is a potential retirement program by the military which could even dwarf the commercial development. With such an over-supply, prices are bound to deteriorate to a ridiculous level when compared with original sales prices. One airline estimates that DC-7s will sell for between \$200,000 and \$300,000, if they can be sold at all.

That would mean that \$750,000,000 worth of DC-7s—some of which will be delivered new this year—will be on the used market with a total potential value of about \$98 million in 1961. Approximately a quarter of a billion dollars worth of long-range Constellations would have a total sale value of about \$32.5 million.

In a recent petition for a realistic depreciation policy by CAB, American termed it "a staggering problem of a magnitude never before encountered." And it is a two-edged sword. For not only does it mean the drying up of a source of revenue counted on for meeting jet commitments, but it portends a new non-scheduled airline era of un-

dreamed-of proportions with serious potential competitive impact.

Minimum industry hopes at this time are for an appropriate depreciation policy by CAB and the possible moth-balling of the military used-transport fleet.

In another critical area, the Dept. of Commerce has dulled the edge of its airways modernization program by proposing an increase in so-called "user charges" which would, in one stroke, wipe out whatever profits the airlines foresee for the early years of the jet age.

Commerce, following through on a January request by President Eisenhower, has asked Congress to add 1½¢ per gallon July 1, 1958, to the existing 2¢ per gallon fuel tax paid by the airlines. The amount would increase each year to a maximum of 6½¢ per gallon in 1962.

At the 2¢ rate, the domestic scheduled airlines paid \$24.8 million in "user charges" in 1957. Even without an increase this year, increased fuel consumption will up the industry total for 1958 to about \$28.2 million.

In fact, with jet engines using up five times more fuel per hour than piston engines, airlines fuel consumption in 1961 will be double that for last year. Thus, here is the tax picture for the next few years with and without the proposed increase:

	Fuel tax at 2¢ rate	Fuel tax at increased rate	Excess at new rates
1959 . . .	\$32,780,000	\$ 69,658,000	\$ 36,878,000
1960 . . .	42,620,000	106,550,000	63,930,000
1961 . . .	49,080,000	141,105,000	92,025,000
1962 . . .	51,400,000	187,050,000	115,650,000

To get the full impact of such an increase, it is only necessary to note that the excess tax alone, starting with 1960, is greater than the highest net profit ever enjoyed by the domestic trunkline industry in any given year. It hardly need be said that a tax which wipes out profits would wipe out the jet program of commercial users of the airways and render much of the multi-billion dollar airways modernization program meaningless.

In one respect, the airlines finally won a major point in getting belated government recognition of the 2¢ tax as a payment for using the airway facilities. This came about in the 1957

Curtis report in which it was stated: "Recent developments have clarified the status of the present Federal tax on aviation gasoline as an existing form of airways user charge."

It was further suggested by the Curtis group that "necessary legislative steps be taken to give official recognition to this airway user charge program." This is significant since, previously, the government considered the airlines to be paying nothing for the use of the airways. The tax money itself was going into a highway fund.

The airline industry appears ready to incur a fair share of the cost of the airways but not at the rate suggested by the President and the Commerce Dept. and not at any fixed long-range rate or formula at this time. Reason is that the uses made of the airways by the military, airlines, corporate and private flyers are so complex that no fixed formula today can apply fairly two years from now.

Once again the determining factor may be the Curtis report, which put the situation to President Eisenhower this way: "It would be appropriate to consider an immediate, orderly increase in the level of the airway user charge program, taking account of the current expansion in airway expenditures, while avoiding too sharp a financial impact on the aviation industry."

In perhaps the most peculiar phase of the over-all national policy for the jet age, the airlines' route structure is becoming more of a hodge-podge system as CAB continues to add new services with the promise of more to come.

Significantly, CAB appears to have departed from the "route strengthening" theory which marked the extensive route grants of the 1955-56 era. Tip-off on this came last month with CAB's press release decision in the Great Lakes-Florida Case when the last remaining trunkline awaiting a "strengthening" route, National Airlines, got nothing in a major handout of Florida routes to other trunks.

Ironically, all those awarded major routes in that decision, according to CAB's own official opinions, were "strengthened" in one or more previous cases.

So far has this round-robin of new competitive route grants gone now that CAB presumably will have to start over to "strengthen" the carriers originally believed capable of sustaining additional competition.

Prime example is Eastern Air Lines which, since August, 1956, has been given new competition on its New York-Florida, New York-San Juan, Chicago-Miami, Detroit-Miami, New York-Houston, Cleveland-Miami, Pittsburgh-Miami and St. Louis-Miami routes, among others.

Coming down the stretch is another major route proceeding—the Dallas-to-the-West Service Case. And just started is a new southern transcontinental route case involving new service between Florida and California

and, for some reason, avoiding consideration of service to Dallas on the proposed new through route.

The airlines, though happy to get new routes, appear more apprehensive when the threat of new competition over their life-line segments becomes apparent. Many carriers blame low load factors of the past year on the fact the industry is still trying to digest the competition authorized by CAB in the 1955-56 decisions.

The load of this added competition plus the impact of the jet financing programs and shrinking profit margins could well lead to a new round of mergers in the industry. This would mean that CAB's "route strengthening" policy to make more effective competitors out of the smaller lines would backfire in the sense that some, at least, were merely fattened for a sale.

Forecast by carriers

The domestic trunks, meanwhile, estimate their traffic will grow to 28.5 billion passenger miles this year, or about 4.1 billion more than in 1957. The impact of jets will be apparent in 1959 as the total will jump to 31.5 billion and continue to 35.2 billion passenger miles in 1960, 40.4 billion in 1961, and 42.9 billion in 1962.

Over the five-year period, forecasts of American Airlines place that carrier at the top of the industry traffic-wise. By 1962, AA, which expects to register 5.6 billion passenger miles this year, forecasts 8.2 billion.

Braniff Airways predicts a jump from 970 million passenger miles this year to 1.4 billion in 1962.

Capital Airlines, in a forecast made before grant to it of a new Buffalo-Florida route, estimated a jump from 1.6 billion passenger miles in 1958 to 2.26 billion in 1962.

Continental Air Lines estimated its traffic would grow from 479 million this year to 815.6 million passenger

miles in 1962.

Delta Air Lines estimated its passenger miles would jump from 1.6 billion this year to 2.6 billion in 1962.

Eastern Air Lines forecast growth from 4.7 billion passenger miles this year to 7.2 billion in 1962. This was before numerous new competitive routes awarded to other carriers by CAB in the Great Lakes-Florida Case.

National Airlines, in a forecast through 1961, estimated growth from 1.1 billion passenger miles this year to 3 billion.

Northeast Airlines estimated an increase in passenger miles from 544 million this year to 1.28 billion in 1962.

Northwest Airlines, without taking into account its new Chicago-Florida route, estimated passenger mile growth from 1.1 billion this year to 1.6 billion in 1962.

Trans World Airlines, also without weighing its new St. Louis-Florida route, estimated growth from 4 billion domestic passenger miles this year to 5.96 billion in 1962.

United Air Lines, in a four-year forecast through 1961, predicted growth from 5.47 billion passenger miles in 1958 to 6.9 billion in 1961.

Western Air Lines forecast 802 million passenger miles for 1958 and an increase to 1.35 billion by 1962.

The industry estimates, meanwhile, anticipate substantial jumps in available capacity with the biggest jumps coming in 1960 and 1961. By 1961, the trunks, which operated 39.8 billion seat miles in 1957, expect to offer 67 billion.

Revenue-wise, the domestic trunks this year expect to gross about \$1,655,754,000. Estimated expenses are approximately \$1,607,418,000. Most of the revenue forecasts, however, were prepared before the unexpected winter traffic slump and the 4% increase granted by CAB. Hence, they are subject to change.

How U.S. airlines stand on jets and turboprop

Airline	720	707	DC-8	Electra	880	F-27	Vis-	Brit-	Total	Dollar Amount*
American	..	30	..	35	..	..	..	..	65	\$ 212.5
Bonanza	6	..	..	6	3.6
Braniff	..	5	..	9	..	..	..	..	14	52
Capital	9	..	60	..	69	90
Continental	..	4	..	..	..	..	15	..	19	38
Delta	8	..	10	..	..	..	18	87
Eastern	20	40	..	..	..	..	60	265**
Mackey	2	..	..	2	1.2
National	6	23	..	..	..	..	29	86
Northeast	5	..	5	17
Northern Consol.	3	..	..	3	1.8
Northwest
Pacific Air Lines	3	..	..	3	1.8
Pan American	..	23	25	..	..	..	..	..	48	295
Panagra	4#	..	..	..	..	..	4#	25#
Piedmont	12	..	..	12	7.2
Trans Caribbean	1	..	..	..	..	..	1	5
TWA	..	33	..	..	30	..	..	..	63	300
United	11	..	40	..	..	..	..	..	51	275
West Coast	6	..	..	6	3.6
Western	9	..	..	..	..	9	19
Wien	3	..	..	3	1.8
Total	11	95	100	116	49	35	75	5	486	\$1,758.5

* Millions (estimated). ** Includes cost of 6 DC-8s optioned.

Panagra aircraft and dollar value assumed in PAA order.

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KEY OPENINGS IN 4 ADVANCED ENGINEERING AREAS AT VUGHT

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Electro-mechanical Systems Analyst. A.E., E.E., or M.E. (advanced degree preferred) with 8 to 10 years experience in analytical design of guidance controls, flight mechanics, dynamics, or comparative applications of applied math. To study advanced weapon systems for guidance, controls, autopilots.

Radar System Engineer or Specialist. A.E., or E.E. (M.S. preferred) with at least 7 years experience in systems and/or design for radar and fire control. To make high-level studies of advanced guidance and control systems.

Advanced Weapons Staff Engineer. Ph. D. preferred, with at least 10 years background in guidance or navigation and control systems. To develop completely new concepts in guidance, navigation, or control systems.

Electro-mechanical Systems Engineer or Specialist. A.E., E.E., or M.E. (advanced degree preferred) with at least 7 years experience in autopilot, flight control, stability systems and inertial guidance systems and design work. To make high-level technical studies of various control and stabilization systems for advanced weapons.

Advanced Weapons Engineer. A.E., E.E., or M.E. (M.S. desirable) able to develop methods for dynamic stability and stabilization studies. To join in, or direct, studies in stabilization, dynamic stability, missile and airframe configurations, and to make flight path and trajectory analyses. All in supersonic and hypersonic range.

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Aerodynamics Engineer. Aerodynamics Engineer with A.E., or equivalent, and at least 3 years experience. To work on supersonic aircraft and missiles in aerodynamic analyses of performance, air loads, stability and control, or fluid mechanics.

STRUCTURES

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Solid State Physicist. Ph. D. preferred, with at least 5 years experience. To assist in studies of: corrosion control; nuclear radiation damage; parts or systems failures for which no causes are apparent; basic phenomena of solids leading to new concepts.

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Test Equipment Engineer. Requires E.E., or Physics Degree and at least 2 years experience in this or related field. (Desirable: broad background in electronics design with emphasis on digital computers or microwave systems.) To join in the design of complete checkout systems for missiles and associated subsystems.

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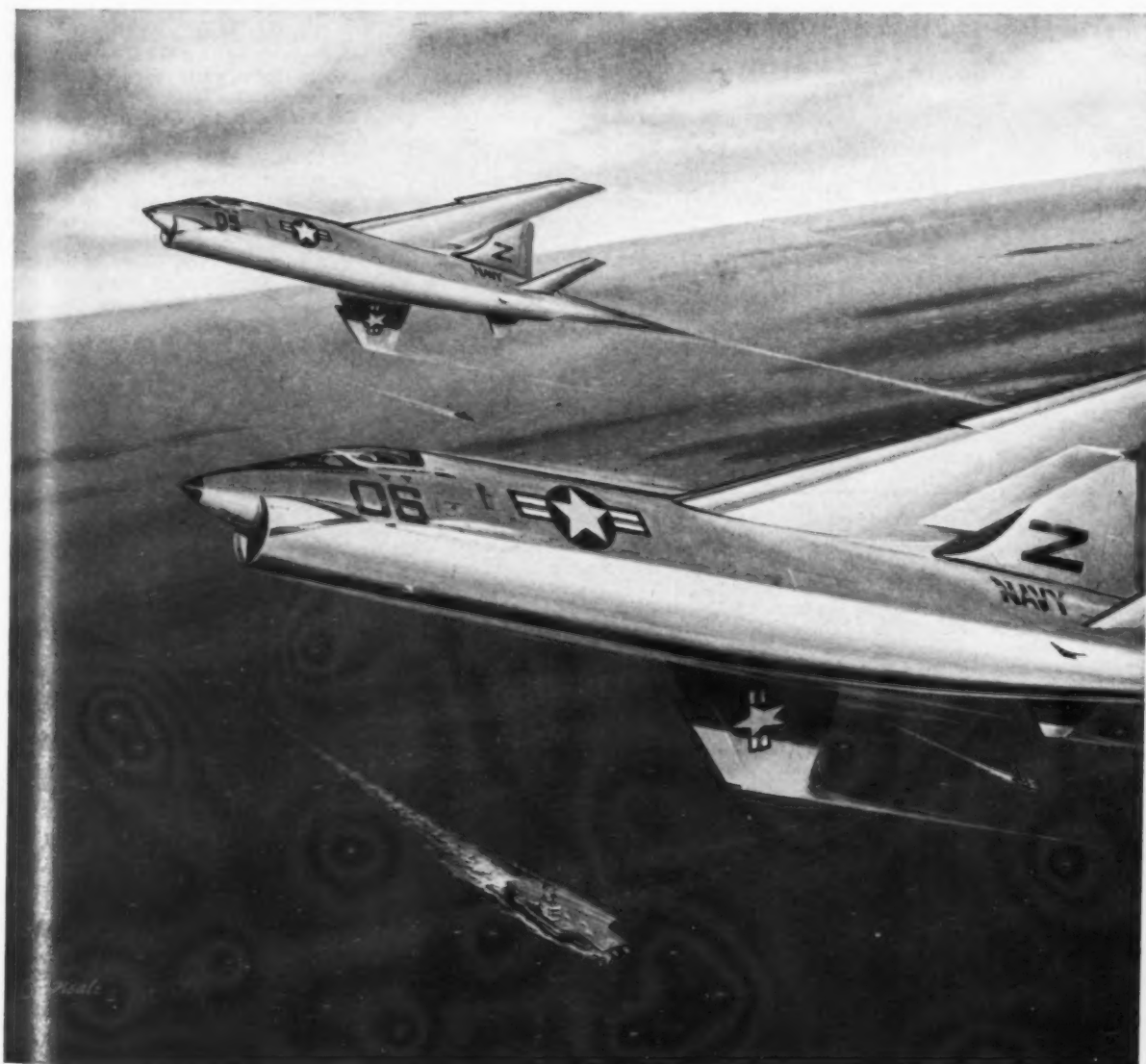
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'58 Forecast: coach income near \$500 million

THE FLEDGLING COACH SERVICE inaugurated by the scheduled airline industry less than ten years ago will this year blossom into a half-billion dollar business and account for 40% or more of the passenger traffic of the domestic trunk industry.

Furthermore, coach traffic will increase at a greater rate than other forms of passenger traffic in the early years of the jet age.

From a modest beginning in 1949, when coach traffic was 3.8% of total passenger business, the twelve domestic trunks last year found coach accounting for 38.31% of passenger business and producing about \$425 million in revenues. And according to five-year forecasts of the trunk carriers, jet age coach will be so productive that by

mile mark and easily the leader in terms of coach business to total passenger traffic with a 55% mark. National Airlines ranked second to TWA in the coach-to-total-passenger traffic category with a 52.65% ratio.

Perhaps the most significant gain in the coach field last year, however, was registered by Northeast Airlines which, in its first year of coach operations, carried 43.95% of its passenger business in coach planes. This stemmed from the fact that NEA put its entire fleet of 10 new Douglas DC-6Bs in coach service on its relatively new New York-Florida route.

Similarly did Continental Air Lines make substantial strides in the coach field by highlighting its new Chicago-Denver-Los Angeles run with extensive

could be singled out to illustrate the increased emphasis on the service which is steadily amounting to a general reduction in fares for the public despite the current furor over fare increases inherent in CAB's General Passenger Fare Investigation.

The airline operator today is finding increased flexibility in pricing thanks to substantial coach operations. This could prove to be one of the major items in CAB's handling of the General Fare Investigation since an increase in basic fares would stimulate or at least provide more room for coach expansion and other promotional type fare reductions.

As for coach in the jet age, Eastern estimates it will pass the 3-billion passenger-mile mark by 1960 and the 4-billion mark by 1962. Of total passenger traffic expected in 1962, EAL predicts 57% will be from coach service.

TWA forecasts over 3 billion coach passenger-miles by 1962 which will account for slightly over 50% of its total traffic that year.

American forecasts 3,226,000,000 coach passenger-miles in 1962 which will be 40% of its total of over 8 billion passenger-miles.

Capital, once a pioneer and leader in the coach field but now last in terms of coach to total traffic, expects to surge back by 1961 when its forecast of 435 million coach passenger-miles will account for 21% of total passenger traffic. In 1962, CAP estimates 588 million coach-miles, or 26% of its total.

United, forecasting through 1961, estimates its coach business that year will be over 2.9 billion passenger-miles, or 43% of its total.

Northeast expects steady coach growth and by 1961 coach will account for 50% of its expected total of 1.2 billion passenger miles.

As for the current year, combined forecasts of the carriers point to about 11.5 billion passenger-miles in coach service, or approximately 40% of total passenger-miles which will be in the neighborhood of 28.5 billion.

How airlines rank in coach traffic

	Rev.-Pass.-Miles-1957			Rev.-Pass.-Miles-1956		
	(000) Total	(000) Coach	%	(000) Total	(000) Coach	%
Eastern	4,398,357	2,094,170	47.61	3,790,759	1,679,822	44.31
TWA	3,661,759	2,014,515	55.00	3,226,510	1,832,846	56.82
United	4,615,944	1,639,798	35.52	4,274,422	1,485,600	34.75
American	5,042,291	1,540,119	30.54	4,800,526	1,410,327	29.37
Delta	1,319,334	518,897	39.33	1,127,109	421,681	37.41
National	897,600	472,588	52.65	949,171	523,762	55.18
Northwest	947,409	412,055	43.49	872,379	335,361	38.44
Western	687,661	221,844	32.26	458,131	126,377	27.58
Capital	1,513,845	151,527	10.01	1,021,564	116,811	11.43
Continental	363,254	129,387	35.62	259,595	32,357	12.46
Colonial .....	.....	.....	.....	39,340	3,209	8.15
Northeast	246,095	108,159	43.95	.....	.....	.....
Braniff	870,606	106,494	12.23	721,617	88,621	12.28
TOTALS	24,564,155	9,409,553	38.31	21,581,123	8,056,834	37.32

NOTES: Northeast Airlines did not operate coach service in 1956.

Colonial Airlines was merged into Eastern Air Lines in mid-1956.

1962 any three of the Big Four will have more coach traffic than did the entire trunk industry in 1957.

Significant in the current picture is the fact that all domestic trunks now provide the low-fare service (approximately 75% of first-class fares) and for 10 of the 12 trunks, coach accounts for 30% or more of total passenger traffic. This compares with the 1956 picture when only 6 of the 12 carriers handled coach traffic over the 30% mark.

Led by Eastern Air Lines, whose coach traffic increased over 400 million passenger-miles, the airlines handled 9,409,553,000 coach passenger-miles in 1957. Of a total increase of 2.9 billion passenger-miles in all forms of passenger traffic, coach accounted for 46% or 1,352,719,000 passenger-miles.

Pressing Eastern for top coach honors last year was Trans World Airlines, the only carrier besides EAL to pass the two billion coach passenger-

coach services. CAL, whose coach service accounted for only 12.46% of total passenger traffic in 1956, jumped to a 35.62% ratio in 1957.

And just as the airlines are realizing more business out of coach service, so too is the passenger getting a better service now for his coach dollar than when the service was first started. In contrast to DC-4 flights in the wee hours of the morning, today's coach passenger can ride the most modern equipment at convenient hours in the fastest possible time.

The Northeast move in placing 10 new DC-6Bs in coach service last year is one illustration of the improved lot of the coach traveler. Equally significant are the mixed-class services (coach and first-class passengers in one plane), offered by TWA in its latest model Constellations and by American in its DC-7s, and even the new "luxury" DC-7 coach service offered by United.

In fact, almost any of the trunks

Coach ratios box score

The following table illustrates how coach has become an increasingly greater part of the industry's growing passenger business:

% coach-to-total passenger traffic	1957 Carriers	1956 Carriers
50%—over	NAL, TWA	NAL, TWA
40%—49%	EAL, NEA, NWA	EAL
30%—39%	AA, CAL, DAL, WAL, UAL	DAL, NWA, UAL
29%—under	BNF, CAP	AA, CAP, CAL, CAL, BNF, WAL

His head—and heart—are 4 miles up

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Lionel Casse is a man who knows fliers—and flying—like the back of his hand. He joined Air France as a pilot in 1938, and to date has logged over 12,000 hours

of flying. He's at home behind the controls of a Constellation, Caravelle, Super Starliner—and the new Boeing 707 Intercontinental jet.

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EQUIPMENT

Ground support: carriers' new cost headache

by George Hart

THE U.S. AIRLINES, having decided upon flight equipment for the jet age, have focused their sights on the problem of how to support the new transports.

The big questions confronting the operators are: (1) what to buy in ground equipment and (2) how much will it cost.

American Airlines' announcement that it is spending \$212.5 million on jet aircraft and \$95 million more on buildings and equipment related to jet operation provides a rough rule of thumb.

Figure out how much the aircraft will cost and add a whopping 44% for facilities and support equipment. And this only covers bricks and hardware.

When a carrier buys jet transports, it is involved immediately with procurement of items ranging from new maintenance shops and terminal buildings to crushed apricot pits for cleaning turbojet compressors.

Committees set up by airlines awaiting the new jets have been tackling these problems and, generally speaking, have come up with most of the answers.

However, many still remain elusive—not because the carriers do not know what they want but because proposed products still are in the development stage.

In the training area, plans still are fluid in many instances.

Surprisingly, less effort than expected has been directed at reducing expenditures by standardization. Airlines still prefer the individual approach and opinions differ even as to airport ramp handling procedures.

New buildings, essential to operation of jet aircraft, account for staggering expenditures by the airlines.

Trans World Airlines completed a \$25-million airframe overhaul facility at Kansas City last year. The carrier has been planning a \$12-million jet engine overhaul center for completion by the end of this year.

Pan American World Airways, scheduled to be the first to operate the jets, is completing a \$20-million jet overhaul base at Miami.

In fact, all the operators of large jet fleets are setting up their own multi-million dollar maintenance and overhaul shops. Only the airlines with a low-volume workload plan to contract with such concerns as Lockheed Aircraft Service, Southwest Airmotive and Pacific Airmotive.

Anticipated doubling of passenger-handling requirements is leading airlines to construction of individual airline terminals at major airports.

At New York International Airport alone, American, Pan American,

Eastern, Northwest, TWA and United are spending some \$60 million for such terminal buildings.

One drawback to the individual terminal, however, is the problem of transporting inter-line passengers from one building to another. Without a doubt, there will be a solution to this, but a good fix hasn't shown up yet.

The new aircraft have brought with them new buildings and new philosophies. However, from the standpoint of complexity, there's nothing as new to the airlines as the gadgetry with which the overhaul shops will be outfitted.

Fortunately, the question of overhaul equipment requirements is one in which the airlines can benefit from the wide experience gained by the military. This is particularly true of engine overhaul, where the biggest changes in procedures and equipment are centered.

New equipment includes machinery for checking concentricity and dynamic balance of compressor and turbine rotors. This piece of test equipment comes for about \$50,000.

Engine fuel systems have to be overhauled and this is no minor item.

A fuel control test stand costs up to \$85,000. Fuel pumps are tested on a stand which runs \$36,000. Fuel manifold and nozzle test stands sell for \$38,000 each.

In addition, the carriers have to



AMERICAN AIRLINES is expanding the \$20-million jet overhaul base it plans to have in operation in Tulsa, Okla. next year. Base will cover 230 acres, includes new jet overhaul shops and test cells (top). Office, stores buildings in foreground.

pay heavily for such items as compressor bleed governor valve test stands (\$22,000), water injection test stands (\$25,000) and, in the case of those buying turboprop aircraft, propeller governor test stands (\$30,000).

One airline estimates that, in order to process three Pratt & Whitney JT3 engines per day, the cost of workshop test equipment alone is about \$550,000.

No mean outlay is that required for special tools and fixtures for engine and accessory tear-down and assembly.

But the carrier is not through with engine overhaul expenses yet. After the workshop phase, the engine must be run in a test cell. Generally, a sound suppressor is required.

A fully instrumented installation of this sort costs the airline as much as \$500,000 per cell.

Maintenance becomes a bulky chore

Even in everyday support, very little of the equipment used with piston-engine transports will be adequate for use with the jet airliners.

In the maintenance areas, airlines will have to erect blast fences to deflect exhaust when making last-minute adjustments. Almost certainly, they will have to employ portable sound suppressors for sustained running at high power settings.

Ground in the run-up areas will have to be kept clean to prevent engine ingestion of foreign objects. This will require more elaborate equipment than has been used in the past.

Provisions for washing aircraft will have to be installed on a larger scale. Capacity of tanks for cleaning materials will have to be increased. Workstands will be much larger to cope with heights of over 40 ft.

Many airlines are confronted for the first time with a requirement for pure water for injection purposes. Average city water will form scale on compressor blades with resultant thrust losses.

Carriers using water injection on piston-engine and turboprop operations never have been faced with so great a requirement. The Boeing 707 carries as much water for increasing engine thrust as a Douglas DC-3 normally carries fuel.

Eastern Air Lines considered the pure water requirement such a headache that this was a major consideration when the company specified the Pratt & Whitney JT4 engine for its DC-8s.

The JT4-powered DC-8 costs about \$600,000 more than the JT3-powered aircraft, but the more powerful engine eliminated the requirement for water injection at airports on Eastern's routes.

Magnification of overhaul and maintenance problems has resulted in introduction of streamlined management techniques. Airlines are adopting production control and machine accounting methods practiced by manufacturing industries.

One of the biggest reasons for this is the spare parts situation. Spares for

the jets are much more costly. Storage requirements are more stringent.

Not only is the jet transport twice the size of current airliners, but systems are many times more complex.

Spares are required on a far greater scale for such areas as oxygen systems, high-capacity AC electrical systems, greater use of hydraulics, increased application of electronic equipment, expanded pressurization and air conditioning systems, etc.

One other result of the spare parts picture is an effort at improvement in the supply pipeline.

Aircraft, engine and accessory manufacturers are being exhorted to increase their off-the-shelf capability. In the past, airlines have been plagued by added expenses due to surplus inventory created by parts obsolescence. Excessive procurement lead time requirements have bred maintenance problems.

Other industries do not tolerate such conditions and the airlines can tolerate them no longer if they mean to remain in business with the jets.

Loading becomes a challenge

Having plotted their course of action in overhaul, maintenance and spares matters, the airlines now find themselves confronted with a whole new set of worries on the loading ramp.

To accomplish an economical operation, utilization of the jet must, if anything, be increased over that of the piston-engine airliner. Turn-around time must be held to a minimum, but this becomes a tricky maneuver with jet "monsters" holding upwards of 150 passengers. In addition, the Boeing 707 can carry as much cargo as a DC-4 freighter.

Higher floor levels in jets (up to 160 ins.) require bigger passenger load-

ing stands if ramps are not built into terminal buildings. Increased weight of these steps means that they must be self-propelled.

Increased number of passengers means expanded catering facilities. Methods of loading meals must be improved.

Baggage- and freight-handling equipment must be made more efficient. Preloaded cargo pods are one way out; however, it is estimated that it will cost about as much to equip 30 DC-8s with such pods as it will to buy one complete aircraft.

While the airplane is at the loading ramp, new higher capacity equipment is required for ground air conditioning, electric power, waste disposal, etc.

The long-range jet transport carries almost three times as much fuel as its piston-engine counterpart. And it is a new type of fuel with as much as four times the water-holding ability of aviation gasoline. Improved filtering and water separating devices must be used.

Hydrant type refueling provisions must be installed at the new terminals to reduce congestion and cope with 1,000 gals/min. pumping rates.

When everything is ready to roll, new equipment must be provided to start the engines—and now the airlines are beset by yet another stickler.

Tow or trundle?

There can be little doubt that the jet transport cannot be taxied out of the loading area. Aside from the danger of lifting debris into the engine inlets of other aircraft, there's the problem of noise, blast and general discomfort to persons at the terminals.

Having decided that the aircraft must be "manhandled" into the open, the question arises as to whether to tow

AIR LOGISTICS CORP.'S wheel-mover pushes Air Force B-52 into position for take-off during test. Other manufacturers whose wheel-movers are being tested are Napco Industries, Minneapolis, and Consolidated Diesel Electric Corp., Stamford, Conn.



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it in the conventional manner or roll its wheels as a delivery man would roll a beer barrel.

The reason this question arises is the appearance of a new breed of cat: the wheel mover, a vehicle which imparts motion by direct connection to the wheels of the aircraft. This type of mover opens new avenues of exploration for the airlines.

Some carriers are asking why expenses should be aggravated in terms of reduction in useful engine life and increased fuel costs due to taxiing.

Proponents of wheel-moving vehicles claim they have the advantage of being able to roll the heavy jet transports at taxiing speeds. In addition, they can be equipped to supply electric and hydraulic power as well as air for starting engines and cabin air conditioning.

In any event, the airlines must buy new moving equipment, either wheel-movers or tractors heavier than generally in use today. The wheel movers still are under development and, in the meantime, at least one airline has contracted to purchase suitable tractors.

It is probable that, ultimately, the carriers will use tractors for towing in maintenance areas and the faster wheel movers for long hauls between hangar and ramp or ramp and runway.

Buying the jets and the support equipment is one thing and operating the fleet is quite another.

Not only must the airlines expend hundreds of thousands of manhours on training of personnel but they must set up new training aids.

Flight simulators at anywhere from \$500,000 to \$1 million apiece are used in the training of flight crews.

Intricacies of engine operation are clarified by use of complex trainers costing over \$100,000 each.

This may seem expensive, but it would cost the carriers more than twice as much to use "live" aircraft and engines for training purposes.

Even so, flight equipment must be set aside for crew checks, etc. Such non-revenue flights are costly.

Centralized training establishments have been set up by some of the major airlines. Others have made arrangements with equipment manufacturers.

Many training programs have not been launched as yet and others are well under way. Some airlines still are trying to decide what constitutes adequate training.

In the last five years, the U.S. airlines have doubled their gross income, but their net profit is half what it was in 1953.

The carriers, unable to increase fares sufficiently to offset rising costs, nevertheless have had to invest vast sums of money to keep pace with phenomenal strides in the development of transport aircraft.

The jet transport has propelled the scope of these investments to unprecedented heights. But the fast-flying jet, not adequately supported on the ground, could be slowed to the schedule pace of today's piston transports.

Jet builders jockey to beat timetable

by Fred S. Hunter

FLIGHT-TEST HOURS on the prop-jet Lockheed Electra and the turbojet Boeing 707 are adding up fast at Burbank and Seattle.

You'll have the opportunity to ride in one or the other, or both, of these high-speed U.S. turbine-powered transports before the end of the year. Two more entries come along in 1959, the Douglas DC-8 and the Convair 880.

Everybody, except Douglas, is ahead of schedule. Douglas had set March 15 for the first flight date for the DC-8, but the airplane didn't roll out of the hangar until April 9, waiting installation of the engine pods and completion of the tail. It will fly in May.

This delay in the first flight date, however, will have little, if any, bearing on the DC-8's production or delivery schedules, and already there are hints Douglas too will be ahead of time when the chips are down.

Douglas already has 11 airplanes in process of fabrication. And its highly fluid production program calls for it to have 35 airplanes built by the time CAA type certification is consummated. It will make use of nine planes in the CAA flight program.

Lockheed's target date for CAA type certification of the Electra is August. Unless unexpected complications occur, it will beat this date and finish up the flight test data for official CAA approval in July. So will Boeing on the 707-120. This is the version of the 707 powered by Pratt & Whitney's JT3 (J57) engine.

With the No. 1 and No. 2 Boeing 707-120s (Pan American) flying and

the No. 3 airplane out the door and ready to fly before the end of this month, Boeing started formal CAA flight testing the week of April 7.

Before starting the CAA tests, Boeing had marked up in excess of 70 hours of company flight-testing on the No. 1 production aircraft and had a good start on the No. 2. It flew a 4½-hour photo mission into British Columbia on an early flight of this airplane. The No. 3 airplane, also scheduled for the CAA flight test program, will incorporate complete airline interior fittings, including seats, buffets, lavatories, etc.

Lockheed has completed about one third of the flight-test program on the Electra and starts CAA tests about four weeks ahead of schedule. Instead of using aircraft sold to a particular customer, Lockheed has three resident aircraft assigned to the flight test program.

The No. 1 Electra incorporates complete instrumentation for performance tests. The No. 2 Electra is the systems airplane and a backup plane for No. 1. Anti-icing tests will be conducted with this airplane. The No. 4 Electra, which was flown the second week in April, contains the airline interior and will be used for accelerated service testing.

Both Boeing and Lockheed have encountered very few technical problems in company flight-testing of the first airplanes, but neither can pinpoint their CAA type certification programs to the letter. There are too many variables. For one thing, the CAA has still to decide what it may require in

the way of an accelerated service test program on either airplane.

A Lockheed engineer speculated that the CAA's requirement for functional and reliability testing of the Electra might be 200 hours.

An even more optimistic Boeing executive expressed the hope that 150 hours might suffice for the 707.

The No. 1 Boeing 707 now flying in Seattle, it might be pointed out, already carries a Pan American Airways exterior paint job. But the No. 2 airplane, also Pan American's, has Boeing 707 markings. This is the airplane Boeing will fly around the country for the CAA functional and reliability test program.

Boeing's \$16-million tanker/transport prototype gamble, which has paid off so handsomely in the sale of KC-135 jet tankers to the Air Force and in projecting the Seattle manufacturer into the lead in commercial jet sales, also gives Boeing an advantage in the test program, including CAA certification. The dash 80, Boeing's designation for the prototype, will be observing its fourth anniversary of operation soon.

Currently, Boeing is flying the dash 80 with three different types of engines installed. The two outboards are of the original set of P&W J57s. One inboard is a production-type JT3. The other is a JT4 (J75) in a 707-320 pod. The 320 is the larger-size, longer-range overseas version of the 707.

The model 320 is getting considerable attention on the prototype at this time. In addition to the powerplant checks being run on the JT4, which de-



FIRST U.S. JET transport to fly and first due to enter airline service is Boeing 707 for Pan American World Airways.

APRIL 21, 1958



DOUGLAS DC-8 rolled out on April 9 and is scheduled for first flight in May. Douglas will use nine DC-8s in CAA program.

velops in the area of 17,000 pounds thrust dry, the dash 80 has been equipped with the on-and-off booster rudder control system Boeing will use on the long-range 707. And recently it installed Goodrich's new liquid-cooled braking system to see whether this might provide better brake cooling for Boeing's bigger 320 models.

Boeing's first JT4-powered 707-320 is due out the door in August. Delivery target to Pan American, which gets the first JT4-powered 320 model as well as the first JT3-powered 120 model, is July, 1959.

Although Pan Am has not announced an official decision, expectations are that it will put its Boeing

equipment in service on the Atlantic and its Douglas DC-8s, which it also has ordered, in the Pacific. PAA gets the first six 707-120s to come off the line. It will take delivery of the first of these in an NX configuration for crew training this summer.

With Boeing's production ahead of schedule, Pan Am will be getting airplanes before its training equipment is ready. This means it will have to use more airplane time than anticipated for training. Since PAA hasn't spoken officially on the allocation of equipment, the date the first Boeings may start carrying passengers over the Atlantic also is still speculative, but November 1 is probably a good educated guess.

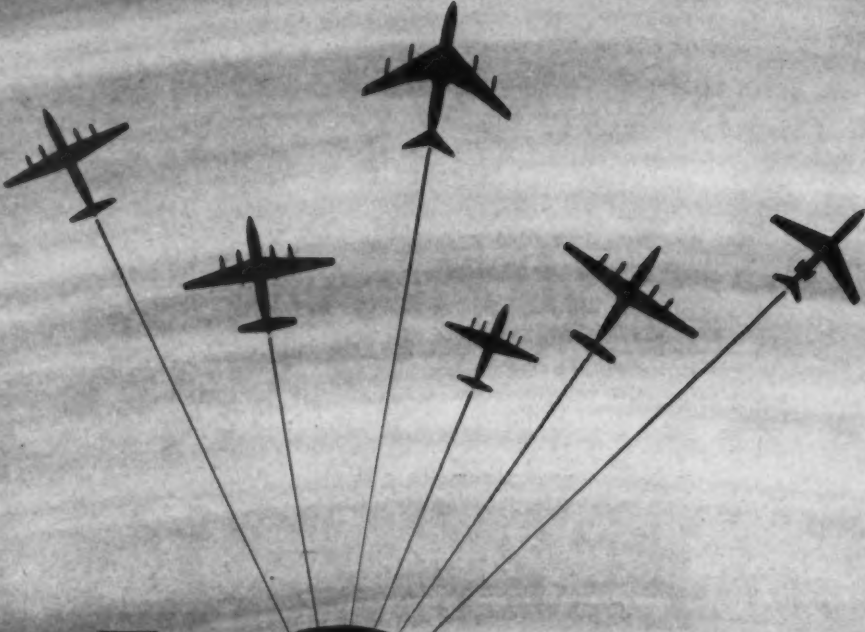
An estimate along the same lines for the start of Boeing 707 service on the transcontinental route in the U.S. is Dec. 1 by American Airlines. The No. 7 and No. 8 airplanes off the Boeing line go to AA, and both are due out the door in June.

Unlike Boeing, Lockheed plans to make no "NX" deliveries of the Electra, and the first plane to Eastern Air Lines is down for September after CAA type certification is completed. EAL is slated for two more in October, four in November and five in December, or a total of 12 in time for the big Miami travel season next winter.

AA will receive two Electras in
(Continued on page 49)



LOCKHEED'S ELECTRA has finished about one-third of flight-testing, will enter CAA certification tests a month ahead of schedule.



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The Air Cruisers escape slide shown here is designed to get passengers out—but quick—with all the dependability of the sunrise.

Dependability has long been an Air Cruisers specialty. It begins in the design stage, where Air Cruisers brings to bear the most advanced,

proved principles of good design. And it continues through every stage of manufacture. For only with precision engineering and fine workmanship can dependability be achieved.

These are the pains that Air Cruisers takes in making all of its products...which also include lightweight industrial plastics and radiation shielding. That's why you can have complete confidence in Air Cruisers' equipment.



AIR CRUISERS DIVISION

BELMAR, NEW JERSEY

LIFE JACKETS • LIFE RAFTS • HELICOPTER FLOATS • ESCAPE SLIDES • PACTON INDUSTRIAL PLASTICS • RADIATION SHIELDING



(Continued from page 46)

December, making the total 1958 deliveries for this airplane add up to 14. In 1959, Lockheed's program calls for the production of 106 Electras. Orders presently on the books total 144, making 24 deliveries extending into 1960.

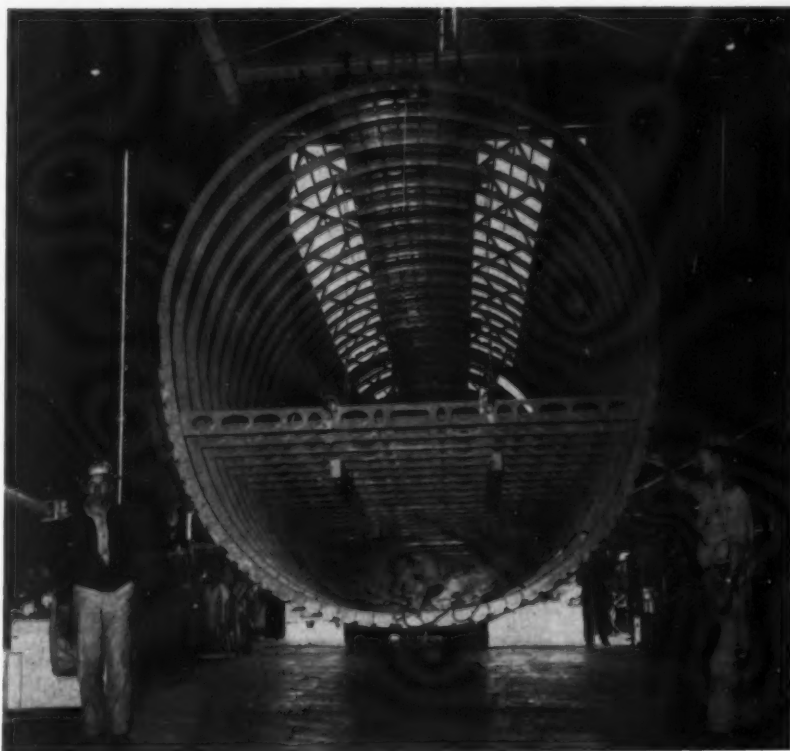
Now that the first DC-8 has rolled out the door the tempo at the \$20-million facility Douglas built for assembly of its big jet airliner at Long Beach will gradually accelerate until an output of six a month is attained in the latter part of next year. The first DC-8 delivery will be an NX airplane to United Air Lines in mid-1959. December 1, 1959 is the date that has been established on UAL's calendar for the introduction of DC-8 schedules on its coast-to-coast route, or approximately one year after American Airlines starts its jet service with Boeing 707s.

The lag between the JT4- or J75-powered DC-8 and the 707-320, the comparable model in the Boeing line, is not so great. UAL is scheduled to start operations with the higher-powered models Feb. 1, 1960.

On several occasions, Douglas executives have expressed the opinion that 175 DC-8s would be ready just as soon as 175 Boeing 707s. One of the more recent utterances along this line was by Arthur E. Raymond, Douglas vice president of engineering. Since Boeing is targeting delivery of its first Boeing 707-320 to PAA in July, 1959, speculation has arisen over the possibility Douglas may have decided, informally if not officially, that there are ways it can advance some of its DC-8 dates.

UAL gets the No. 2, 3 and 4 DC-8s with JT3 engines, then No. 4, 5 and 6, equipped with JT4s, go to Pan Am. No. 8 is another UAL plane after which comes the British Conway in the No. 9 plane for Trans-Canada Airlines.

METAL MOCKUP AT CONVAIR, shown in exclusive photos (wing above, aft fuselage below) is an adaptation of an F-102 manufacturing technique being used to speed 880 production at San Diego. Major assembly on 880 began on schedule in March, engines are due from General Electric for first aircraft in July and pods/pylons from Rohr Aircraft Corp. in September. Rollout and first flight will take place in January 1959. Convair will use three aircraft in CAA flight program with certification expected May 1, 1960. By this time, 13 "NX" models will be in customers' hands, nine to TWA and four to Delta. TWA will get first "NX" in November 1959 and Delta its first in January 1960.



REPORT ON PASSENGER FEATURES



THE BOEING 707 STRATOLINER (above) is designed for medium to long-range routes; the 707 Intercontinental, for over-ocean routes, and the 720 for short-to-medium range routes. All will bring unprecedented passenger comfort to the world's airlines.



PASSENGERS WILL RELAX in luxuriously comfortable cantilevered chairs that provide unobstructed leg room. Built-in opaque window shades will cut any undesirable glare.



GALLEYS ARE LOCATED both forward and aft for efficient, flexible food service for up to 189 passengers. On ground, galleys are quickly serviced through special hatches.



IN SPACIOUS 707 AND 720 CABINS, passengers will enjoy a ride totally free of fatigue-inducing vibration. At night, ovalled dome lights create the illusion of star-flecked sky. Windows—twice as many per seat row as in conventional airliners—provide unobstructed view even from aisle seats. Overhead passenger service units contain reading lights, call buttons, individual speakers. Ventilation system changes air rapidly without draft. Movable bulkheads and seats set in tracks can be changed to any combination of 4, 5 or 6-abreast seating to meet all competitive situations.



707 AND 720 CABINS provide for club-like lounges forward and aft. They can be replaced by additional seating. Boeing jetliners combine passenger-pleasing luxury with economical flight and maintenance features that add up to profitable operations for airlines.

BOEING

Family of jet airliners

These airlines already have ordered models of the Boeing family of jetliners:
AIR FRANCE • AIR INDIA • AMERICAN • B.O.A.C. • BRANIFF • CONTINENTAL • CUBANA
LUFTHANSA • PAN AMERICAN • QANTAS • SABENA • TWA • UNITED • VARIG

Jet sales battle at fever pitch

A TAUT SALES DRAMA is being enacted on the transport stage by the manufacturers of new-type, turbine-powered equipment. Nothing like it has ever been seen before in the industry.

There are a number of reasons why this is so. Uppermost is the competition for the dollar. Money is short and money is tight. And airplanes are more expensive. Numerous carriers would like to place orders—or re-orders—for more turbojets or turboprops if they could arrange satisfactory financing.

"What terms can you offer?" is the question an airplane salesman gets from an airline prospect as soon as he knocks on the door. Airplane salesmen used to take an engineer along on sales calls to answer technical questions. Now they need a banker.

Another conspicuous reason is the number of new aircraft on the market. It used to be that an airline would make a choice between two different planes, never more than three. Now count 'em. The Boeing 707, Douglas DC-8, Convair 880, Lockheed Electra, Fairchild F-27, Viscount, Britannia, Vanguard, Caravelle, Comet and the new de Havilland.

Count, too, the fact that the commercial sales picture has been knocked a little askew. For two decades the prestige of commercial leadership was firmly settled in the Douglas Aircraft Co.'s sprawling plant at Santa Monica. Lockheed was the principal challenger. When these two went four-engine after World War II, Convair seized the opportunity to pick off the twin-engine market. The Southern California companies were in command.

But not now. Up in Seattle, the Boeing Airplane Co. has become the Douglas company's principal challenger and, in fact, currently is the leader in total sales, although Douglas has the satisfaction of having sold to more airlines. Lockheed has branched off into the turboprop and short-/medium range market, whereas Convair has chosen to go a new route by plunging into the four-jet field.

Boeing's commercial jet sales total 162 to 14 airlines, those of Douglas 138 to 17 airlines, of Convair 63 to five airlines. Lockheed has sold 143 turboprop Electras to 11 airlines and it has a customer for an executive plane, General Motors, for a grand total of 144.

The Douglas DC-8 lineup is as follows:

Pan American, 17; United, 40; National, 6; KLM, 8; Eastern, 20; Japan, 4; SAS, 7; Panagra, 4; Swissair, 3; Delta, 8; Trans-Canada, 6; UAT, 2; TAF, 2; Olympic, 2; Panair do Brasil, 4; Trans Caribbean, 1; Alitalia-LAI, 4.

Lockheed's Electra orders:

American, 35; Eastern, 40; National, 23; KLM, 12; Braniff, 9; Western, 9; Indonesia, 3; Cathay Pacific, 2;

Pacific Southwest, 2; Ansett, 4; Aeronautes, 3.

With 34 Boeing 707s and 30 Convair 880s on order, TWA is the biggest purchaser of pure-jet equipment to date. United is next with 40 DC-8s and 11 Boeing 720s. American, however, edges out TWA on total turbine-powered aircraft with a total of 65, made up of 30 Boeing 707 jets and 35 Lockheed turboprop Electras. AA also is reported planning to add to this fleet by placing an order for a third type of equipment, a lighter turbojet for medium-range operation. Boeing and Convair both have been striving for this order, Boeing for its 720, Convair for a stretched-out version of its 880 containing more seats.

Illustrative of the dramatic characteristics of the sales battle going on between the commercial aircraft manu-

facturers is the fact that sales actually have been few and far between for the last year or more. Everybody is hungry. Of Boeing's 162 sale total, 83 were sold in 1955 and 63 in 1956.

The Seattle manufacturer sold only 16 aircraft in 1957, five 707s plus the ice-breaking 720 order of 11 to UAL. No 1958 sales have materialized although orders from at least three carriers are said to be very near.

Douglas had a big year in 1955, selling 96 DC-8s in the last three months of that year. It sold 19 more in 1956, 18 in 1957 and five so far this year.

Little wonder that the aircraft manufacturers are fighting so desperately for sales. The stakes are big. Douglas recently disclosed that it had spent more than \$200 million in payrolls, engineering, facilities, tooling and material for the DC-8, and this is even before it has flown the first airplane.

Airline	Total Quantity	Model 120	Model 220	Model 320	Model 420	Model 720
Pan American ...	23	6	..	17	..	..
American	30	30	..	..	..	..
Braniff	5	..	5	..	..	..
Continental	4	4	..	..	..	..
Air France	17	..	..	17	..	..
Sabena	4	..	..	4	..	..
TWA	8	8	..	..	..	..
Lufthansa	4	..	..	..	4	..
Air-India	3	..	..	..	3	..
Qantas	7	7	..	..	..	..
BOAC	15	..	..	..	15	..
Cubana	2	2	..	..	..	..
Varig	3	..	..	3	..	..
United	11	..	..	..	..	11
Totals	136	57	5	41	22	11

BOEING SALES actually total 162 including 136 announced, 26 unannounced, with latter (you guessed it) from Hughes Tool Co. for TWA. This order is understood to be for 10 more Pratt & Whitney JT3-powered 120s and 16 JT-4 powered 320s.

Progress report on noise suppressors

With the first jet airliner scheduled to be ready for operation by the end of the year, a report on a critical issue—jet engine noise—is in order.

In Seattle, Boeing has settled on a 21-tube suppressor, which combines a thrust reverser, and the device is installed and working on the 707-120s now being flown in the flight-test program.

Performance is eminently satisfactory, Boeing reports. Tests have demonstrated the power loss is less than the 2%, which Boeing promised as the maximum, and the decibel count runs lower than that guaranteed by the company. Boeing is continuing development hoping for still greater improvement.

The news from Santa Monica is just as good. Douglas has released no information on its system as yet, but the word is out that it is showing virtually no loss of takeoff performance at all. One of the methods tested by

Douglas incorporated the use of flaps around the jet nozzle to diminish noise at takeoff and a clamshell device to reverse thrust after landing.

Douglas is said to have made significant gains by combining elements of other methods, including addition of an ejector tube around the nozzle so the exhaust itself will become the core of a rapidly moving cold air stream.

Boeing is now engaged in a test demonstration program for the Port of New York Authority. Austin Tobin, executive director of the authority; John R. Wiley, director of the aviation department, and Herbert O. Fisher, chief of the aviation development division, recently visited Seattle for a preliminary demonstration of the effectiveness of the Boeing suppressors.

The program is to be continued with more demonstration tests at Seattle and then at Edwards AFB, where Boeing will do the heavy-load flight-testing on its 707s.

AIR CARGO

Cargo nears billion ton-miles

by Wallace I. Longstreth

THE FIRST of the billion-ton-mile years for U.S. airlines carrying cargo moved a step closer in 1957.

When traffic results for the year were tabulated, the amount of air cargo (airmail, air express and airfreight) totaled 766,971,473 ton-miles, a gain of 7% over 1956—an all-time record.

Significantly, airfreight ton-miles made up nearly three-fourths of the total, as this segment of the airlines' traffic racked up a gain over the previous year of more than 21% to 552,977,656 ton-miles.

Total ton-miles of mail hauled also gained—about 9% with the non-priority mail (3¢ mail-by-air) included. Regular airmail, alone, just failed to stay on a par with 1956. The total for 1957 was 151,121,169 ton-miles, or 977,000 ton-miles less than before.

Air express was a real disappointment. When 1957 is compared with 1956, air express declined more than 6,000,000 ton-miles, from 52,278,000 to 46,269,556 ton-miles, or 11%.

But traffic statistics tell only a part of the story.

Air express in 1957 encountered a crippling strike of truck drivers in seven of the nation's largest cities. Not only was air express denied traffic for 90 days from and to these points, but many air express customers learned there were other ways to hurry things from origin to destination. This benefited airfreight, air parcel post and the airfreight forwarders.

There were other things benefiting airfreight, so that after full express service was restored in August, airfreight continued to boom until a marked decline in the U.S. economy slowed airfreight as 1957 came to an end. But the gains recorded earlier in the year let the airlines close the books on the most successful year for airfreight.

Airfreight benefited last year from rate increases granted surface carriers, particularly the railroads. Railroad passenger train service was cut back still more. (Thirty years ago there were 10,000 passenger trains available for mail and high-priority small packages. Today, there are about 2,500.) Planes, buses and trucks filled the gap.

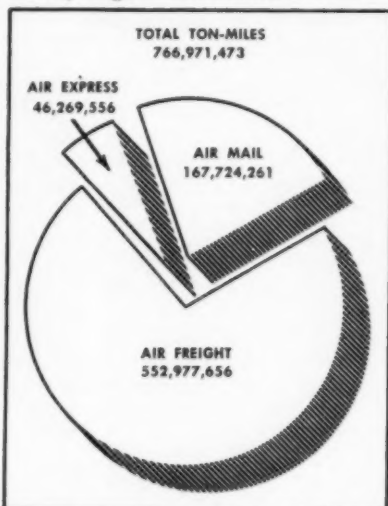
The Greyhound companies joined with the nation's airlines to provide fast transportation connecting even the smallest towns with the big centers of trade. Bus-air service, true, is limited to relatively small packages, but the coverage is complete and the price reasonable.

Larger shipments benefit from

truck-air arrangements which are expanding rapidly. With truck-air service, the reach of airfreight is unlimited.

Any recounting of the factors contributing to the growth of airfreight in 1957 must certainly include the simple facts that there were more and better-trained airfreight salesmen pounding the streets for traffic to fill the bigger and better airplanes that were added during the year. New aircraft included all-cargo planes and combination passenger-cargo planes.

Air freight dominates . . .



The Flying Tiger Line went into a full Super Constellation 1049H operation. American, Slick and United expanded DC-6A fleets. Delta started operating specially modified C-46s. So did Riddle.

International U.S. airlines also expanded capacity. Pan American boosted transatlantic all-cargo flights to 12 a week. Panagra added all-cargo service to Latin America, and so on. As cargo capacity increased, the airlines in-

creased the cargo sales force.

When only domestic airfreight is counted, the Flying Tigers took over the number one spot from American. The Tigers hauled 82,986,089 ton-miles of airfreight in 1957, a gain of 23%. American's total, 82,486,146 ton-miles, was 15% over the year before.

When mail, express and freight from all scheduled operations are included, the top five U.S. cargo-carrying airlines stack up in this order: Pan American, 133,110,040 ton-miles; American, 113,038,237 ton-miles; United, 93,241,527 ton-miles; Flying Tigers, 83,657,675 ton-miles; and Trans World Airlines, 64,019,149 ton-miles.

Airfreight forwarders also expanded their activities manifold, and some of the antagonism between airlines and forwarders faded. In some instances, conferences between airline and forwarder personnel helped to develop new sales programs and better inter-company relations.

When 1957 closed, it was apparent that airfreight forwarders were a potent force in the airfreight business.

There were about 50 airfreight forwarders filing reports with the Civil Aeronautics Board during 1957. Reporting procedures for forwarders are undergoing revision by the Board. Last year, reports varied somewhat in what was reported. But it appears that, as a group, the forwarders bought in excess of \$22 million worth of transportation for airfreight shipments. The ten largest airfreight forwarders bought \$16 million, and Emery Air Freight, alone, paid the airlines more than \$5 million for airfreight transportation.

Emery's gross income, reported at nearly \$11 million for 1957, is greater than the gross reported by most of the local service airlines.

Scheduled domestic trunk airlines still dominate air cargo carriage in the United States. In 1957, the trunks handled 63.8% of the air cargo;

Cargo traffic picture at a glance

Airlines	Mail (including non-priority mail)	Air Express	Airfreight
Domestic trunk	95,952,420	42,751,481	218,592,760
All-cargo	1,861,425	1,554,913	193,727,986
U.S. International	65,516,982	286,562	124,952,882
Local Service	1,520,182	1,642,681	2,082,903
Alaskan	2,699,867	.....	12,019,870
Territorial	81,198	1,594,214
Helicopter	92,187	33,918	7,041
Total	167,724,261	46,269,556	552,977,656

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Recently, the Hertz advertisement featuring Mr. Cerf appeared in leading national magazines. Millions of

readers found that when Mr. Cerf travels, he goes the fast, time-saving way—by plane. At his destination, he rents a new Turboglide Chevrolet Bel Air or other dependable Hertz car.

That's The Hertz Idea. Mr. Cerf's got it. And, more and more people are getting it every day. Result? More business—from new passengers, and passengers who will use The Hertz Idea again and again. To make sure of a steadily increasing volume of business

for both of us, Hertz has counters and "Call A Car" phones in airports across the country. And Hertz offers your passengers nation-wide "Rent it here . . . Leave it there" service.

Now, Mr. Cerf is doing a great job in our bigger-than-ever campaign to sell plane-auto travel. But, we need your help, too. Here's all you do: mention the Idea of renting a car in your advertising! Hertz Rent A Car, 218 South Wabash Avenue, Chicago 4, Ill.

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More people by far...use
HERTZ
Rent a car

Top ten airfreight forwarders in 1957

(Ranked in order of air transportation purchased from scheduled airlines.)

Forwarder	Paid to Airlines	Total Revenue	Number of Shipments	
			Received from shippers	Consigned to airlines
Emery Air Freight Corp. ...	\$5,060,714	\$10,959,465	419,119	240,703
Air Express International Corp.	4,431,780*	5,194,022*	69,094	14,360
American Shippers, Inc.	2,440,377	3,533,740	322,868	56,214
Airborne Freight Corp.	2,208,351	3,216,182	125,382	55,353
Shulman, Inc.	1,251,511	2,704,358	383,231	2,808
United Parcel Service-Air ..	1,140,631	1,255,540	701,676	11,143
W.T.C. Air Freight	942,154	4,170,367	49,284	6,392
Wings & Wheels Express, Inc.	723,701	1,389,960	89,989	23,055
World Wide Services, Inc. ..	432,272	616,875	16,315	3,025
ABC Air Freight Co.	576,027	680,882	72,341	15,917

*Including operations as Cargo Sales Agents.

the all-cargo airlines, 35.2%. But the all-cargo lines are taking a bigger bite of the airfreight haul. Last year, they handled 46.7% of domestic airfreight.

Money-wise, proponents of air cargo still find there is much to be desired. The rate of growth of traffic is encouraging, but the total take is still well under 10% of gross airline revenues.

In 1956, scheduled U.S. trunk-

lines which haul passengers and cargo took in some \$92 million from hauling things—a little over 7% of the gross, in 1957, gross cargo revenues climbed to \$98,301,947, or 6.9% of gross trunkline revenue.

Airfreight fared only slightly better. In 1956 it accounted for 3.3%; last year, 3.5% of the trunks' gross.

Three of the trunk airlines were well above the industry average. Cargo

produced 9.2% of American's gross, with airfreight accounting for 5.9%. United's cargo amounted to 9.3%, with airfreight at 4.6%. Northwest's figures were 9.4% for cargo and 4.8% for airfreight.

Despite the fact that airfreight is still a relatively small part of airline revenue, more people are agreeing that airfreight is important. Although CAB was, and still is, very busy with its general passenger fare investigation, it found time for some consideration of airfreight problems, and it is believed by many that the board will soon set up a separate office devoted entirely to air cargo.

There was a dark side to 1957, too. The all-cargo airlines found the going rough, and service to a number of points was discontinued. This was not because of a decline in common carrier airfreight traffic, but because of a decline in revenue from other sources.

The anomalous condition stems from the fact that there is not, today, enough money in airfreight to support the operations needed. The all-cargo lines have always supplemented income with commercial charter operations, outside maintenance and overhaul activities, and military passenger and cargo hauling contracts.

In 1957, the military's use of commercial air transport declined sharply. The effect was so severe that Slick Airways, in February 1958, suspended all common carrier operations because there was not enough money to continue.

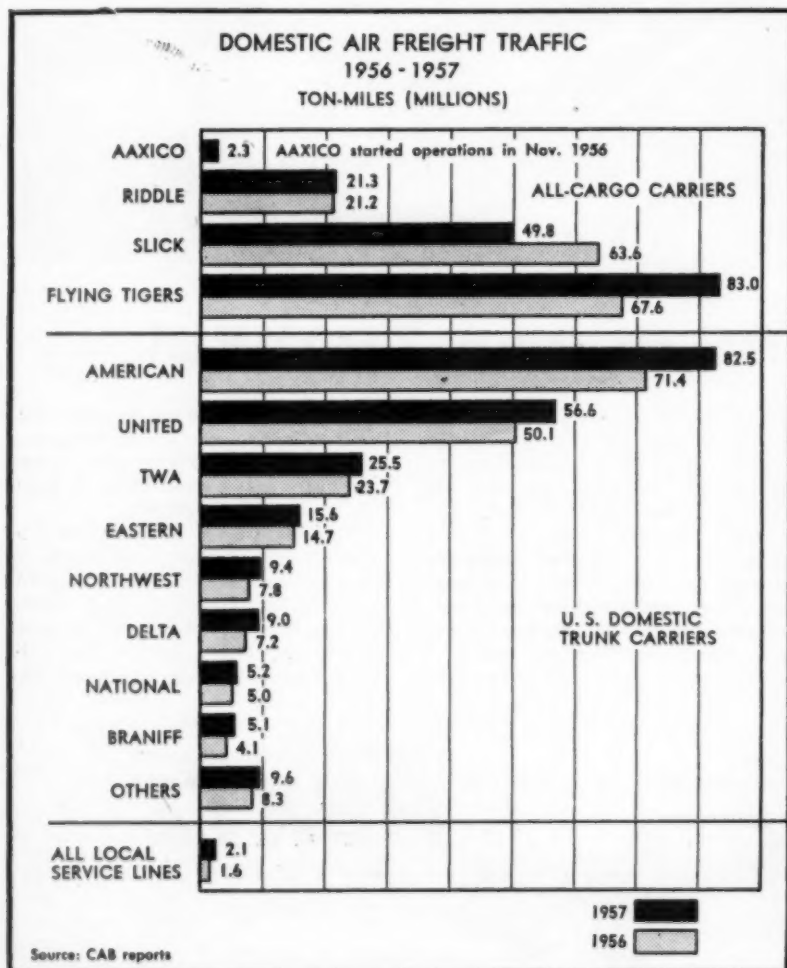
Riddle, too, was hard-pressed, as were all the carriers geared for military operations. Riddle discontinued service to some of its smaller points, but kept the primary operations going.

Both Riddle and Slick have petitioned CAB for subsidy relief. Slick believes that, with subsidy, service can be restored. Riddle is afraid that without subsidy it will have trouble continuing its operations. Each carrier said the subsidy relief is being requested for only a temporary period—until the economic climate improves and more economical equipment is introduced.

Equipment was the subject of considerable study last year. It was recognized by the industry that ground handling procedures, including shipping procedures to and from airports, had to be modernized to stay abreast of the rapidly increasing capability of aircraft.

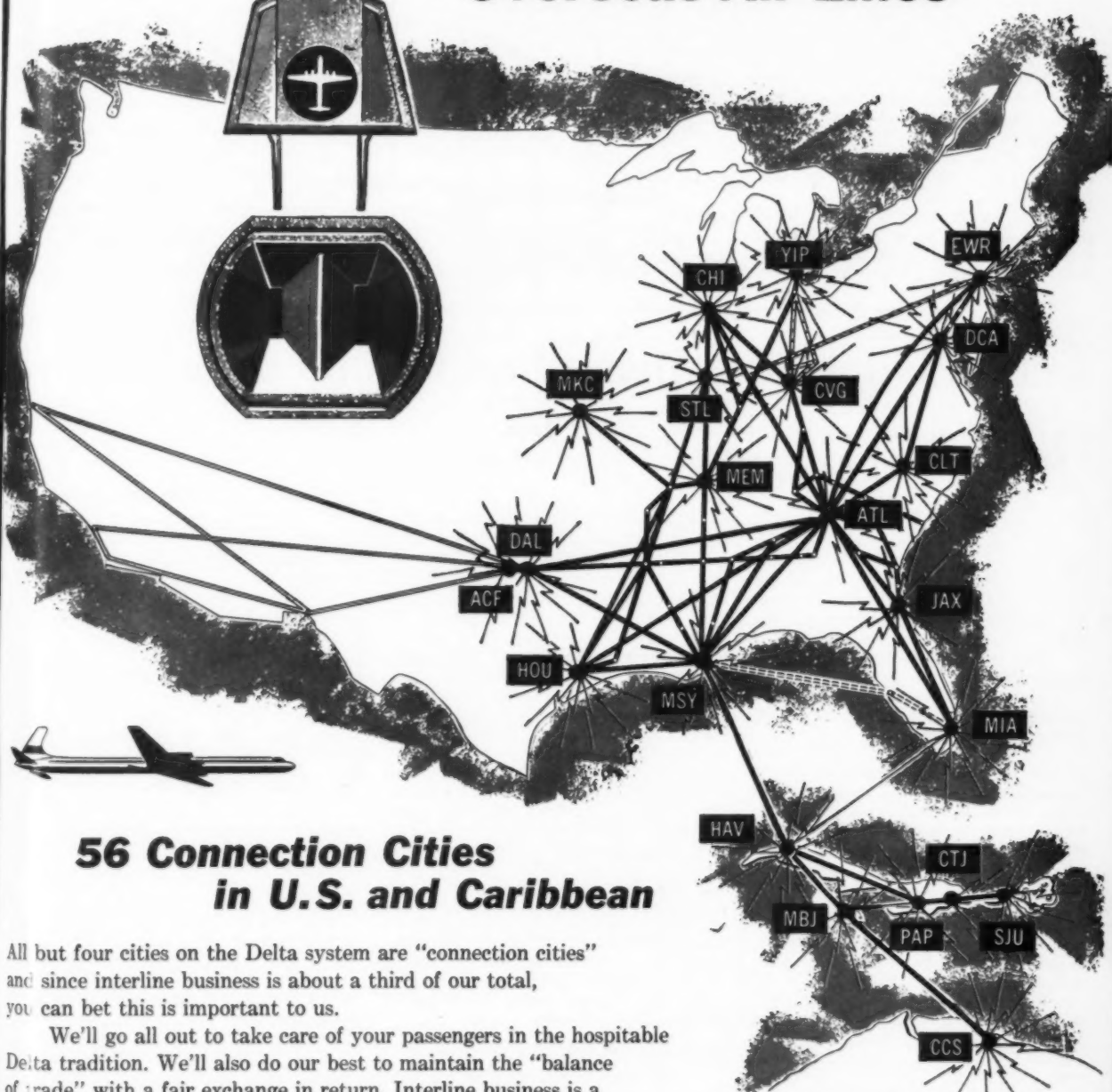
The question of how to modernize was turned over to the New York firm of Drake, Startzman, Sheahan and Barclay, transportation and materials handling consultants, by the airlines, through Air Cargo, Inc. (a wholly-owned airline corporation). The consultants' report is in. It deals primarily with the cartage services, but in so doing, provides answers which should bring all of the ground handling operations to a better level.

As to the effects of the economic climate, nothing so positive can be ad-



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We'll go all out to take care of your passengers in the hospitable Delta tradition. We'll also do our best to maintain the "balance of trade" with a fair exchange in return. Interline business is a two-way street and we want to make it mutually profitable.

Drop in and see us whenever you're in Atlanta. George Shedd is our Interline Sales Manager.

GENERAL OFFICES: ATLANTA, GEORGIA

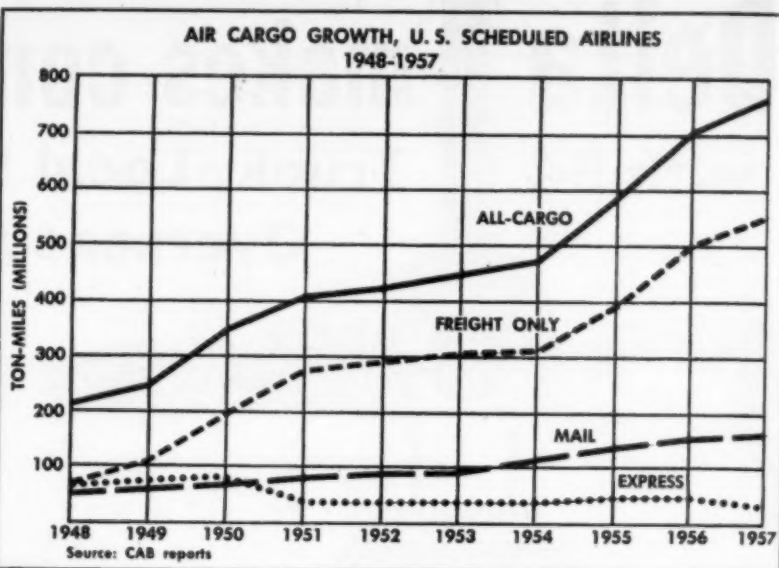


vanced. Certainly, the sag in airfreight toward the end of 1957 reflected the decline in the gross national product. This conformed to past experience.

However, the first three months of 1958 have produced more airfreight traffic than any previous January, February and March. The airlines are hoping (if there is still a recession) that the upturn in traffic means that the advantages of swift distribution are being understood by U.S. businessmen. When money is tight, the tendency is to back off from warehousing, reduce inventories and cut pipeline times, literally, buying only what is needed when needed. Airfreight provides the answer for such a hand-to-mouth operation.

On the other side of the coin, if the nation's economy moves up, airfreight should also.

Thus, with such a "can't lose" prospect, and the equipment to handle a billion ton-miles of cargo easily, airfreight will have a good year in 1958.



Transatlantic passengers top 1 million in '57

Fourteen U.S. and foreign lines score 23.5% gain over previous year, carrying 968,000; charters carried 53,800.

by Eric Bramley

Nineteen fifty-seven was a stand-out year for the U.S. and foreign-flag airlines flying transatlantic routes between the U.S., Canada and Europe.

For the first time, more than one million passengers flew the Atlantic.

Air travel practically equaled steamship travel.

Air traffic showed its biggest percentage gain since 1952, when tourist service was introduced.

The 14 U.S. and foreign lines carried 968,146 first-class and tourist passengers on regular schedules between the U.S., Canada and Europe, a 23.5% jump from the 783,835 hauled in 1956.

Charter flights carried an additional 53,800, for a grand total of 1,021,946. Totals include Canadian Pacific Airlines' Vancouver-Amsterdam polar route, but do not cover Scandinavian Airlines System's polar operation.

The 23.5% increase compares with a 20.17% gain in 1956 over 1955, 18.58% 1955-54, 8.56% 1954-53, 17.6% 1953-52, and 30.9% in 1952 over 1951.

Members of the transatlantic passenger shipping conference reported that their steamships carried 1,030,000 passengers last year, compared with the 1,021,946 air travelers. Thus, air was 99.2% of steamship. A year ago it was only 82%.

The airlines operated 23,771 flights in 1957 (up 12.8%), offered 1,450,418 seats (up 18.4%) and filled

66.75% of them. Of the flights, 14,203 were mixed (carrying both first-class and tourist passengers), 6,447 were tourist, and only 3,121 first-class.

Tourist-class traffic continued its rapid growth. Last year, three out of every four transatlantic passengers traveled tourist—739,498 out of the 968,146 total (charters not included). Out of a total of 1,450,418 seats offered by the carriers, 1,075,148 were tourist.

The tourist passenger total was 25.6% ahead of 1956, while first-class traffic increased only 9.6%. The number of tourist seats offered for sale was 20% greater than 1956; first-class 14.2%. Tourist load factor was 67.78%, first-class 60.93%.

Cargo continued a healthy growth, reaching 22,136.9 tons, up 18.2%. Mail increased 9.9% to 10,220.9 tons. Between the U.S. and Europe, excluding Canadian traffic, cargo totaled 20,527.8 tons, up 19.8%, while mail gained 10% to 9,440.3 tons.

U. S. carriers get 42.6%

Last year saw a drop in the U.S. airlines' share of the Atlantic business. Pan American World Airways and TWA carried 412,415 passengers, or 42.6% of the total, while the foreign lines hauled 555,731, or 57.4%. TWA and PAA offered 42.8% of the total seats, the foreign lines 57.2%. In 1956, the two U.S. lines handled 46.3% of the business.

On the U.S.-Europe routes, ex-

cluding Canada, PAA and TWA slipped below 50% of the total traffic, handling 412,415 passengers out of 852,080, or 48.4%. They offered 48.1% of the seats. In 1956, PAA and TWA carried 52.4% of U.S.-Europe traffic; in 1955, 53.8%.

These two carriers hauled 46.2% of the total first-class passengers and 49.9% of the U.S. first-class. In the tourist field they handled 41.5% of total and 47.9% of U.S.

Pan American leads all

PAA led in passengers, cargo and mail. It transported 26.7% of all passengers and 30.3% of those to and from the U.S.

In the cargo field, PAA, TWA and Seaboard & Western had 42.1% of the total business and 45.4% of the U.S. business. In mail, PAA and TWA had 62.8% and 68%, respectively.

The top five carriers of first-class passengers, in order, were: PAA, BOAC, TWA, KLM and Air France. Tourist leaders were PAA, TWA, BOAC, KLM and SAS. In both classes: PAA, TWA, BOAC, KLM and Air France.

Westbound from Europe to the U.S. and Canada, the passenger total was 541,380 and the load factor a whopping 74.16%. Eastbound passengers totaled 426,766, with load factor of 59.24%. High westbound figures were partially due to low-fare immigrant traffic.

Air traffic both ways between U.S., Canada and Europe, 1957

UNITED STATES TRAFFIC

	AF	Alitalia	BOAC	Lufthansa	El Al	Iberia	KLM	PAA	Sabena	SAS	SBW	Swiss	TWA	U.S. TOTAL	CPAL	Lufthansa	KLM	TCA	Canadian TOTAL	GRAND TOTAL
Rev-passengers	20,792	2,032	28,509	4,440	12	1,953	18,349	77,955	5,492	15,348	0	8,890	27,447	211,439	6,267	1,918	17	2,594	6,213	17,009
Seat capacity	30,648	6,677	41,950	9,463	36	6,724	32,174	123,049	15,421	25,421	0	12,509	46,061	344,950	9,823	5,846	32	4,071	10,548	30,320
% seats used	67.8	30.4	67.9	47.2	33.3	29.0	57.0	63.35	33.6	60.38	0	71.07	60.02	61.35	63.80	32.81	53.13	63.72	58.91	58.10
1st class flights	102	453	723	0	0	0	484	1,580	0	34	0	108	72	3,110	8	0	0	2	1	11
Mixed flights	1,428	453	602	816	2	271	475	3,268	691	1,336	0	649	1,903	11,911	568	395	0	988	2,312	14,203
Cargo flights	117.5	350.0	1274.9	645.9	197.8	71.0	392.2	470.2	109.3	131.1	0	126.2	170.9	205.7	257.4	137.8	1.7	300.5	1,609.2	2,714.3
Mail (tons)	485.4	174.8	861.0	533.7	25.0	29.9	154.4	370.3	192.7	284.9	0	288.5	270.7	940.3	199.0	5.1	1.2	54.9	531.3	1,023.9
Rev-passengers	54,449	10,129	51,481	33,002	7,987	6,034	53,420	180,871	34,484	57,830	0	24,812	125,942	640,441	20,409	12,017	209	15,385	42,837	99,057
Seat capacity	75,152	19,991	70,234	46,087	13,575	12,894	75,796	267,296	55,730	87,816	0	34,882	182,295	943,648	39,478	18,240	262	19,944	53,346	1,075,148
% seats used	72.45	50.92	72.30	71.61	58.84	46.80	70.1	67.16	61.88	65.85	0	71.13	67.09	67.87	72.10	65.85	79.77	77.14	80.27	75.33
No. of flights	201	0	544	15	239	1	791	1,681	290	537	0	4	1,906	6,259	104	13	0	71	0	188
Rev-passengers	75,241	12,161	79,990	37,642	7,999	7,987	71,769	250,826	39,976	73,178	0	33,702	153,589	852,080	34,574	13,935	226	17,979	49,050	116,065
Seat capacity	105,800	26,548	112,184	55,550	13,611	19,618	107,970	397,345	65,968	113,237	0	47,391	228,356	1,284,598	49,501	24,094	294	24,015	63,916	1,450,418
% seats used	71.12	45.77	71.30	67.80	58.77	40.71	66.47	65.97	60.60	64.62	0	71.11	67.26	66.12	70.46	57.88	76.87	74.87	76.74	71.73
No. of flights	1,735	453	1,869	831	241	272	1,750	6,529	981	1,957	0	761	3,881	21,260	700	408	4	410	989	2,511

Air traffic Westbound between U.S., Canada and Europe, 1957

UNITED STATES TRAFFIC

	AF	Alitalia	BOAC	Lufthansa	El Al	Iberia	KLM	PAA	Sabena	SAS	SBW	Swiss	TWA	U.S. TOTAL	CPAL	Lufthansa	KLM	TCA	Canadian TOTAL	GRAND TOTAL
Rev-passengers	10,608	1,047	13,975	2,263	0	885	9,684	41,483	2,440	7,722	0	4,326	14,757	109,147	3,281	1,054	8	1,486	3,300	9,129
Seat capacity	15,842	3,264	21,110	4,739	18	3,848	19,735	67,425	5,132	13,977	0	4,303	22,772	171,098	4,644	2,924	14	2,311	5,249	15,764
% seats used	66.96	31.22	64.17	48.39	0	24.47	49.04	61.46	47.64	57.04	0	68.63	64.80	63.06	64.10	37.32	50.00	49.73	62.63	60.04
1st class flights	53	703	343	0	0	0	248	790	0	0	0	54	36	1,541	5	0	0	0	0	1,547
Mixed flights	73	226	305	408	1	135	222	1,422	349	673	0	324	940	5,908	294	192	2	172	497	1,157
Cargo flights	0	0	0	0	0	0	188	310	8	622.9	0	225	54	833	0	0	0	0	0	833
Cargo (tons)	548.6	171.9	358.5	545.1	7	100.9	204.7	298.6	469.5	1,641.1	0	717.7	101.2	1,143.3	191.1	1.6	1.6	195.4	678.2	1,183.4
Mail (tons)	389.3	164.8	740.8	483.4	17.4	20.4	135.1	984.7	176.0	233.7	0	250.8	879.0	4,495.4	194.4	2.4	.9	46.6	49.8	293.1
Rev-passengers	30,375	5,655	29,854	18,523	4,491	4,784	37,540	136,557	27,613	44,499	0	17,511	89,873	473,754	20,348	9,223	129	10,104	23,480	57,574
Seat capacity	37,874	9,916	35,731	23,419	6,784	4,427	37,540	136,557	27,613	44,499	0	17,511	89,873	473,754	20,348	9,223	129	10,104	23,480	57,574
% seats used	80.17	57.09	83.55	79.09	64.20	52.58	82.58	91.41	71.75	75.80	0	76.91	77.42	77.22	83.61	74.24	97.73	88.89	87.44	84.76
No. of flights	99	0	276	9	116	1	396	841	147	294	0	2	941	3,122	59	11	0	54	124	3,246
Rev-passengers	48,983	4,702	43,839	20,816	4,491	4,244	40,685	147,155	22,641	40,722	0	17,792	84,517	474,177	20,793	7,901	137	11,592	26,780	64,703
Seat capacity	53,728	13,720	54,851	29,181	6,492	4,902	54,645	195,452	32,774	57,167	0	23,014	117,645	444,854	28,312	12,047	148	13,500	32,123	83,130
% seats used	74.69	50.50	77.99	71.83	64.02	43.44	75.81	74.26	68.54	71.43	0	74.71	75.03	73.58	80.17	65.58	92.57	85.87	83.37	80.24
No. of flights	855	226	944	417	117	134	846	3,253	496	994	0	380	1,917	10,591	358	203	2	227	497	1,287

Air traffic Eastbound between U.S., Canada and Europe, 1957

UNITED STATES TRAFFIC

	AF	Alitalia	BOAC	Lufthansa	El Al	Iberia	KLM	PAA	Sabena	SAS	SBW	Swiss	TWA	U.S. TOTAL	CPAL	Lufthansa	KLM	TCA	Canadian TOTAL	GRAND TOTAL
Rev-passengers	10,184	985	14,534	2,367	12	1,048	8,645	36,272	2,844	8,106	0	4,545	12,890	102,492	2,786	844	9	1,108	2,913	7,880
Seat capacity	14,806	3,223	20,830	4,724	18	3,381	16,049	61,424	5,078	12,724	0	4,206	23,289	171,852	4,859	3,022	16	1,940	5,279	15,116
% seats used	68.78	29.64	69.77	50.11	67.00	31.59	53.99	59.05	56.01	63.71	0	73.56	55.35	59.64	61.45	28.59	56.25	57.11	55.18	52.13
1st class flights	54	0	340	0	0	0	236	790	0	17	0	54	36	1,549	3	0	0	0	1	1,554
Mixed flights	722	227	297	408	1	134	253	1,446	342	663	0	325	963	5,983	294	203	2	165	491	1,105
Cargo flights	630.9	178.1	729.8	4	0	0	224	301	13	588.1	0	254	48	964.6	1	0	0	0	0	964.6
Cargo (tons)	96.1	10.0	100.2	287.4	96.9	50.0	187.0	172.1	428.5	1,234.9	0	544.8	69.2	964.6	64.3	20.7	0	106.1	233.6	428.2
Mail (tons)	485.4	174.8	861.0	533.7	25.0	29.9	154.4	370.3	192.7	284.9	0	288.5	270.7	940.3	199.0	5.1	1.2	54.9	531.3	1,023.9
Rev-passengers	24,074	4,474	21,627	14,479	3,496	2,655	22,419	75,389	14,671	24,100	0	11,345	56,182	274,911	11,597	5,170	80	5,279	19,357	41,483
Seat capacity	37,246	9,975	34,503	22,668	6,791	4,647	38,256	132,739	28,117	43,317	0	17,371	92,422	446,892	19,330	9,025	130	13,500	28,514	63,574
% seats used	64.40	44.85	62.68	63.87	51.48	41.05	58.40	54.79	52.18	55.44	0	66.31	60.79	58.51	59.99	57.29	61.54	61.56	73.01	65.25
No. of flights	102	0	268	6	123	1	395	940	143	293	0	2	965	3,137	45	2	0	17	0	64
Rev-passengers	34,258	5,459	36,161	16,846	3,508	3,723	31,084	111,441	17,515	32,206	0	15,910	69,072	377,403	14,583	6,034	89	6,387	22,270	49,353
Seat capacity	52,072	13,298	55,333	27,392	6,809	5,948	54,305	194,163	33,195	56,041	0	23,577	115,711	441,744	20,189	12,047	146	10,515	31,793	78,990
% seats used	65.79	41.05	65.35	61.50	51.52	37.80	57.24	57.51	52.76	57.47	0	67.48	60.79	58.81	60.29	60.96	60.74	60.74	70.05	59.24
No. of flights	880	227	975	414	124	136	884	3,276	485	973	0	381	1,944	10,469	342	205	2	183	492	1,224

NOTES: (1) Cargo and mail totals include tonnage carried on first-class, tourist, mixed, and all-cargo flights. (2) Total number of flights includes first-class, tourist and mixed. (3) On Nov. 1, 1957, Alitalia took over the former Linee Aeree Italiane transatlantic route. Alitalia's total includes January-October LAI traffic.



ANTI-SUBMARINE DUTIES—New weapons systems have immeasurably strengthened the U.S. Navy's capabilities in anti-submarine warfare. A key role is assigned to HSS helicopters (Sikorsky S-58s) equipped with sonar. These

are the Navy's only anti-submarine helicopters. Three are shown here operating from a carrier during anti-submarine warfare exercises at sea. S-58-type helicopters are widely flown in both military and commercial service.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS



HIGH ALTITUDE TRAINING—Seventy Marine Corps pilots and crew members tested performance of HUS helicopters (Sikorsky S-58s) at high altitudes and in extreme cold in the mountains of California. Aircraft were flown at 12,500-foot altitude, operating despite snow and ice.



AIRBORNE RATIONS—A twin-engined Army H-37 (Sikorsky S-56) lifts a sling load of C-rations during tests at Laguna Airstrip, Yuma, Arizona. The largest known operational helicopters in the world, versatile H-37s have transported heavy Army missiles, vehicles, and artillery pieces.



Photo: San Diego Union-Tribune

SPEEDING PLANT CONSTRUCTION—Lifting more than 100 tons of heating and ventilating equipment to the rooftop of a huge factory, a Sikorsky S-58 accomplished in two days a job which would have taken four weeks with ordinary crane equipment. The S-58 made 70 quarter-mile flights from a loading yard to the roof of Convair's

new Atlas missile plant in San Diego, spotting loads on the 13-acre roof to a tolerance of less than one inch. Construction officials said this was the largest helicopter job ever performed on a plant construction project, an airlift that saved thousands of dollars as well as the four weeks' time.

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Jets overshadow world transport scene

by Anthony Vandyk

THE INTERNATIONAL air transport picture is dominated by the shadow of the jet. Both economically and operationally, the jet raises a series of questions, the answers to which will not be fully known until the aircraft come into service.

While Air France, BOAC and UAT can boast experience with jet transports, thanks to their operations with Comets a few years ago, only two airlines have had any intimate acquaintanceship with modern high-performance jets. These two carriers are Russia's Aeroflot and Czechoslovakia's CSA. Both operate Tu-104s to several Western European cities. Neither has shown any enthusiasm about reporting its experience to Western carriers.

The Soviet bloc airlines do not have to worry too much about operating costs. But other air carriers do. The economy of the jet is still very debatable. Manufacturers have come up with some brochure figures which show very definitely that jets will be money makers even on short hauls and with comparatively low load factors. Certain of these figures are based on the availability of very long runways, tight scheduling with high aircraft utilization, long-term amortization and the assumption that governments will not tax jet fuel in the way that they tax avgas.

While most airlines are accustomed to taking manufacturers' brochure figures with a grain of salt more and more airline planners are becoming convinced that the jet makes sense economically.

To some extent the profitability of the jet in international service will be determined by the airlines through the decisions of the International Air

Transport Assn. The international association will soon have to decide whether premium fares will be permitted for jet services. This matter is tied up with the whole question of fare differentials.

There are many operators who wish to keep present piston-engine equipment in service after jets come into operations. These carriers would like to see a lower fare charged for the services operated with the obsolete aircraft. On the other hand, several of the larger international airlines want to use jets for all classes of service and therefore are against the idea of charging a premium for the faster aircraft.

Complicating the fare differential question is the turboprop transport. Although there are likely to be comparatively few more operators of long-haul turboprop aircraft, it has already become apparent that a differential is going to be demanded. The big turboprop has only recently entered service and it is still too early to assess its popularity. Indications are, however, that the average passenger prefers the turboprop to the piston-engine aircraft under conditions of equal speed and liability.

One of the dominant features of the past winter season on the international scene was the introduction of the turboprop Britannia to the Western hemisphere. This aircraft is now used by three carriers: Aeronaves de Mexico, BOAC and El Al. It will soon be introduced into service by Canadian Pacific and Cubana. At this writing it is uncertain whether Northeast will take delivery of Britannias for use on the route to Florida.

Sales of Britannias and Lockheed Electras have been influenced to some

extent by the general success of the first turboprop transport to enter airline service—the Viscount. There are few countries outside the Western hemisphere where the Vickers aircraft is not a regular part of the scene at the major airports.

KLM recently started Viscount operations and another major European carrier, Lufthansa, will shortly do so. Nonetheless, the backlog of uncompleted Viscount orders is diminishing and it seems unlikely that there will be many more new customers for this aircraft. Vickers expects that a revival in interest in turboprops will come in the form of order, for the Vanguard.

Notwithstanding all the talk of jets and turboprops, the bulk of the world's air traffic continues to be carried in piston-engine aircraft—almost all of American manufacture. On the longhaul routes the Douglas DC-7C and the Lockheed L-1649, backed by DC-6Bs and Super Constellations, predominate.

The range of the DC-7C and the L-1649 have enabled carriers to begin non-stop service between most western European cities and New York in both directions. Air France has used its L-1649 equipment to start a one-stop service over the pole between Europe and Japan, an operation pioneered by SAS last year.

The availability of ultra-long-range equipment has made polar routes extremely attractive to both operators and passengers. PAA and TWA have followed SAS' lead in providing polar flights from the West Coast to Europe. Many other carriers would also like to get into this act but the U.S. government has shown itself reluctant to grant traffic rights to the West



DOUGLAS DC-7C is used by more North Atlantic carriers for non-stop services between U.S. and Europe than any other transport.



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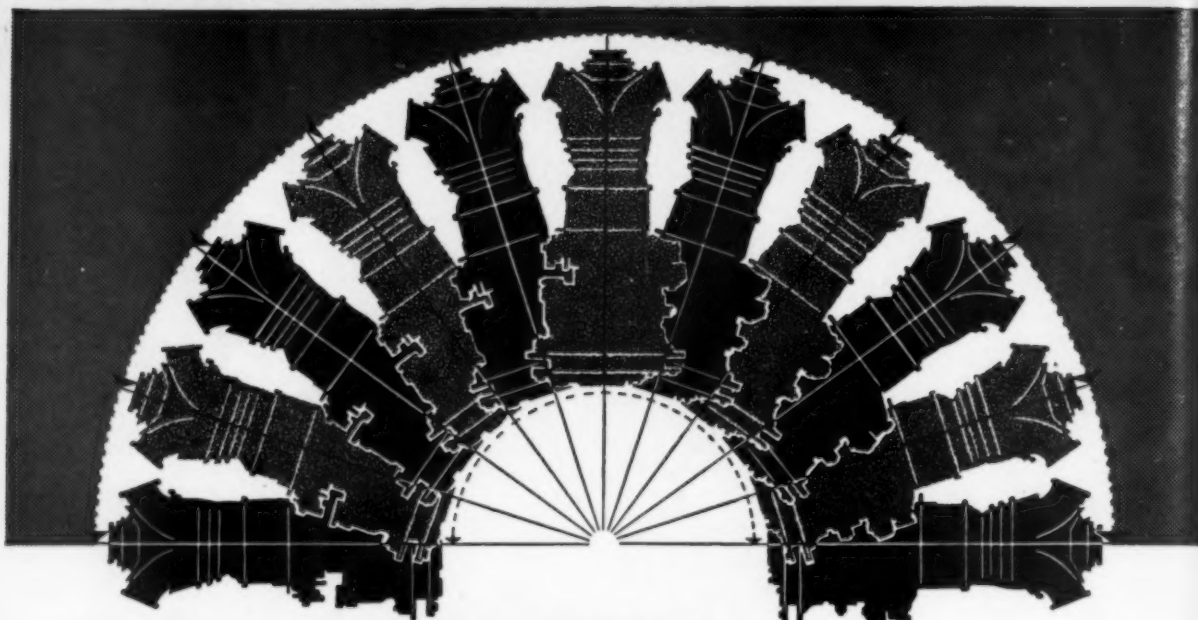
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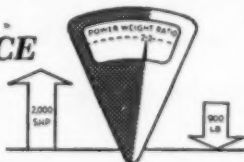
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The Bristol 192—chosen by the British Royal Air Force—is powered by two Gazelles.

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AMERICAN AVIATION



LOCKHEED L-1649 is used by Air France, Lufthansa and TWA for ultra-long-range operations.

Coast unless the airline's nation has something to offer which U.S. carriers desire. The French have felt particularly hurt about the U.S. attitude which prevents Air France getting a route to the West Coast unless another authorized route is given up "in exchange."

In all fairness it must be observed that the U.S. is not the only country that is acting tough on matters of traffic rights. Throughout the world there is a general tightening up, and new concessions are only won on a basis of horse trading. Thus, for the countries with little to give and much to obtain, the situation is deteriorating. For the big "have" nations, on the other hand, a policy of "sit tight and give nothing" seems to pay off for the national carriers concerned.

Notwithstanding the increasing difficulty in obtaining traffic rights, new routes are still being opened and regional carriers are spreading their wings across continents. More and more South American carriers are planning operations to the U.S.—Chile's LAN, Uruguay's PLUNA and Argentina's Transcontinental, for example. VARIG is planning to become the second Brazilian carrier to serve Europe, while REAL has aspirations to carry the flag of Brazil to the U.S. West Coast and on across the Pacific to Japan.

Perhaps the most important development in South American aviation is the increasing number of carriers operating cut-rate services to the U.S. Almost every South American country now has a non-IATA airline serving the U.S. or plans to establish one. Domestically, in the Latin American nations, air transportation is booming.

The introduction of private-enterprise competition for Aerolineas Argentinas has done a lot of good for the Argentine air passenger, forcing the nationalized carrier to improve its service. In Brazil regulated competition keeps all the airlines very much on their toes. However, the economic situ-

ation in Brazil is such that most of the carriers are having a hard time making any money with fares pegged at their present level.

Within Europe, where fares went up by between 3% and 5% April 1, carriers are generally happy about their rate of return. Their complaints are mostly directed toward the traveling habits of their customers which prevent full utilization of equipment on intra-European services.

Vacationing passengers continue to travel on weekends while promotional early-morning and late-night fares have generally had very small acceptance. Departures before 9 a.m. and arrivals after 7 p.m. are distinctly unpopular in Europe.

An important development on the European air transport scene is the remarkable increase in the number of air services operated by British independents in conjunction with bus services. By using aircraft to fly the over-water portion of the journey, the cost of the overall trip from London to Paris is cut to almost the same level as for surface transport. The time is a little longer than by carriers flying directly from capital to capital but not excessively so. Another growing part of the British independents' business is automobile ferry services to Continental Europe.

Notwithstanding the success of SABENA's helicopter operations (to be reinforced this season with Vertol equipment) the Belgian airline remains the world's only carrier to provide international scheduled services with rotorcraft. Several companies are hoping to enter this field when turbine helicopters are available but for the time being are unwilling to operate rotorcraft services because of the high operating cost of present equipment.

There is no carrier in the world that would refuse to buy an economic VTOL or STOL aircraft but at the moment there is nothing on the horizon despite all the talk of boundary layer control and air flaps. The Scottish

Aviation Twin Pioneer is the only plane currently available that has exceptional airfield performance but its reception among airlines has not been enthusiastic and sales have been small to date.

Whether it is an STOL model or not, there is a burning need for DC-3 replacement equipment the world over. The veteran Douglas transports are still in excellent shape and will continue to be usable for many years to come. But operators now realize that the DC-3 just is not an economic proposition and therefore must be replaced.

With the decreasing prices for used DC-4s and Convairs, the smaller carriers are tending to look increasingly favorably on this form of solving (partially, at any rate) their DC-3 replacement problem. Sales of the F-27 have not been particularly numerous although all who have sampled the Dutch-designed transport are enthusiastic about it. The F-27 seems to represent a good DC-3 replacement for those who require a sophisticated transport. But for the bush operators, pressurization and other niceties of the F-27 may seem to be unnecessary.

If the DC-3 is replaced by DC-4s, Convairs and Viscounts, it will mean that many airfields presently served will be deprived of service, for none of these three types is suitable for operation from the small grass strips used today by so many DC-3s. Nevertheless, operators have found that the use of large aircraft on small fields with hard strips is not as difficult as had been expected. Panair do Brasil, for example, uses Constellations on many small fields in Brazil, while PAA has substituted DC-6Bs for Convairs on several Caribbean routes. Certainly, aircraft with JATO bottles for emergency purposes can be used out of very inadequate airports while reversible propellers (unknown to DC-3 pilots) do wonders in cutting down landing roll.

Notwithstanding all these facts, it is not satisfactory to use aircraft that



THE BRITANNIA is now operated by BOAC from London as far west as San Francisco and as far east as Tokyo and Sydney. After a period of "teething troubles" the big turboprop transport is settling down well.

are not designed for the job, but until a really acceptable DC-3 replacement design comes along the present situation will not change much for the better.

What then, are the main highlights of the international air transport scene?

Passenger traffic continues to dominate and will probably do so for several years—at any rate until the airlines adopt a new type of aircraft specially designed to haul freight.

More and more carriers are ply-

ing the airlines of the world,—some for national prestige rather than for profit.

The competitive situation is intensifying, although IATA regulations make it difficult for airlines to sell against one another—fares, seat pitch and food service are all precisely spelled out by IATA.

The introduction of economy class on the North Atlantic is a step toward tapping the mass market but whether the rate of return on this fare will be sufficient for the smaller airlines to

make a profit is questionable.

The economic health of the international carriers, generally, is improving but the jet age may set the clock back. Within a few months PAA will take delivery of Boeing 707s to be used initially on the North Atlantic (probably starting Nov. 1). Air France and SAS will be getting Caravelles while BOAC will be re-introducing Comets on its route to Australia before the year is ended. The jet indeed casts its shadow over the entire international scene.

Traffic up 12%, ton-miles 10% for French carriers

by Jean-Marie Riche

THE FRENCH AIR TRANSPORT INDUSTRY has shifted its full attention to the complex problems associated with the advent of the jet age. Final deliveries of the latest types of piston aircraft—the Super Starliner Lockheed 1649A for Air France and Douglas DC-7Cs for TAI—took place last year and early this year.

With more than three million passengers carried during 1957, airlines flying the French flag increased their traffic by 12% over 1956 and augmented their ton-miles by 10%. Load-factors remained at a relatively high average: 68%, although a slight slump occurred during the second part of the year.

Air France flew 76% of the total ton-miles and was responsible for 81% of the passenger and 73% of the cargo totals. Traffic growth was not as spectacular as that observed in 1956 although CGTA-Air Algérie, a subsidiary of the French Line (Compagnie Générale Transatlantique) succeeded in increasing its passenger traffic by 41% (nearly 330,000 passengers carried) hiking itself to an enviable position



NORD 2508, latest version of the Noratlas. Nord Aviation has built 181 of the twin-boom transports for military, is producing 51 more.

among the European medium-haul operators.

Air Algérie recently ordered three Caravelle twin-jetliners to replace its fleet of Constellations and DC-4s at the beginning of 1960. Meanwhile, technicians of TAI and UAT-Aéromaritime are hard at work getting ready for the introduction of the DC-8 on their respective long-haul networks and Air France has succeeded in completing with U.S. banks financial arrangements to buy a fleet of 17 Intercontinental Boeing jets. Although, the French air-

lines now have on order 36 jets, 21 longhaul Boeings and DC-8s bought on the U.S. market and 15 medium-haul Caravelles which will be built in France. These planes will begin to enter service at the end of this year and will all be in use in 1961. In fact, the French may finally get about 50 jets on their routes during the next three years, the balance of the 36 aircraft now on firm order being mostly Caravelles which Air France is going to reorder.

At the end of 1957 and at the

Vertol 44 solves transport problem for oil industry

The petroleum industry has a new tool, the Vertol 44 helicopter, to cut manhours, money and misery out of exploratory drilling at remote sites.

The Vertol 44 is a heavy-duty, universal vehicle that makes the sky a 100 mph highway, almost any clearing a landing field. Gone is the need to hack roads in jungle, swamp and mountains. You may need it for these money-saving missions:



Flying Truck: The Vertol 44 carries more than 2 tons of cargo in tropical areas... transports the entire 175,000 lbs. of a drill rig over a distance of 50 miles out and back, in only 56 flying hours. Its 600 cu. ft. cabin accommodates 50% more cargo than any other commercial helicopter, with no problem of load placement.

Flying Bus: Airlifts up to 19 passengers ... 2 typical field crews ... to jungle derricks or offshore drills ... flies exploration teams to otherwise inaccessible spots.

Flying Crane: Hops rivers, ridges and swampland with sling-loads of pipe, rig superstructure, large pump components or even mobile field offices.

Flying Tractor: Frees mired vehicles, hauls barges, drags sledges. It has even towed a 3,000-ton ship.

For more information on this multi-purpose vehicle for the oil industry, write to: Customer Relations Department

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MORTON, PENNSYLVANIA.

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APRIL 21, 1958

65

beginning of 1958, some secondary problems came into the limelight, mostly for political reasons. One is the creation of Air Inter, an airline created to serve domestic routes, which, benefiting from full "detaxation" of avgas, has started limited operations with chartered aircraft on three metropolitan routes. Another problem is the construction of a rail link between Orly Airport and Orsay station.

However, the attention of the French carriers is still concentrated on the many problems associated with the operation of the jets themselves. In this field, the French operators are not exactly facing the unknown since UAT Aéromaritime and Air France have had costly pioneering experience, each with three Comets. Also, the experimental operation of the Caravelle prototypes has yielded worthy lessons which, altogether, help the French airlines to have a better appreciation of the technical and commercial problems

Aéromaritime and two in North Africa by Air Algérie. Thirty-nine more remained on order for the military, three more for the civilian users.

But Nord-Aviation, the manufacturer, which has been very slow in starting a sales campaign for the design, because of the heavy military demands, has good hopes to sell more Noratlases, especially of the new Pratt and Whitney equipped (2508) version. This aircraft has given a good account of itself during recent operational tests in mountainous areas in India.

In a smaller class of aircraft, the success of the Noratlas is matched by that of the light transport Broussard, built by Avions Max Holste of Rheims. With military or civilian markings, these seven passenger transports have now logged more than 30,000 hours of flying. A total of 120 are now in service with the French Air Force and several hundreds are on order. A prototype (Broussard 1522) equipped with

ing 150 of these jets.

Firm orders have been slow to materialize on the books of Sud-Aviation but, considering the long absence of the French manufacturers from the world market, Sud Aviation deserves credit for having sold 26 of its revolutionary aircraft and in having enlisted among its customers such airlines as SAS, Air France, Varig, Air Algérie, Finnair. Sud-Aviation hopes to transform in firm orders in a not-too-distant future some of the 37 Caravelles which they have on option on their books. It is convinced that only after the Caravelles will have demonstrated their qualities in operation will the aircraft score a real commercial breakthrough. A batch of Caravelles should then be almost immediately available for the buyers.

Both the French government and Sud-Aviation appreciate that a success of the initial batch of Caravelles can be consolidated only if an advanced or rather several advanced versions of the aircraft are planned now. It is obvious that the French government will not refuse its support for the construction of more powerful Caravelles, now being designed.

Sud-Aviation devotes the greatest attention to the timely delivery of its production Caravelles. According to present schedules and taking into account the delays resulting from modifications of the basic accommodations requested by the operators, the first Caravelles should be in service under both Air France and SAS markings within a year from now. Both airlines have acquired good experience with the prototypes. SAS has issued a very laudatory statement on the use of a Caravelle prototype under severe winter conditions in Northern Sweden.

In Europe, the Caravelle is definitely the closest competitor to the Soviet-built Tupolev 104A, which will be massively used in the almost immediate future by the Behind-the-Iron-Curtain airlines on their expanding routes in Europe and the Mediterranean area.

These trends about developments in the French air transport industry and airlines would not be complete without mention of the work by Sud-Aviation on the Super Alouette, a bigger brother to the successful Alouette helicopter. And also of the work by Breguet—an old name which recently received wide publicity in the Americas by the demonstration of its Deux Ponts cargo—on an interesting STOL design whose experimental version, the Breguet 940, is now on the eve of its test flying. This aircraft will be followed by a 40-passenger STOL transport, the Breguet 941, in which great hopes are placed by both military and civilian users. While the Caravelle is moving into the production stage, this Breguet Integral certainly looks like the most promising French genuine transport aircraft project being presently developed.



FRANCE'S ENTRY in jet transport competition, Sud Aviation's Caravelle, is shown in production at the Toulouse plant of French manufacturer.

involved.

At this stage, the jet age effort of the French aircraft industry is centered almost exclusively on the Caravelle. With a reduced budget, the industry obviously cannot afford to waste its efforts on too many projects. It has therefore made a bet on a design which has received worldwide attention.

Orders are slowly building up for the Caravelle. It should not be forgotten that they constitute the first international breakthrough of the French aircraft industry on the world market for transport aircraft since the end of World War II.

It would be unfair, however, to forget other designs which, in their particular fields, are the bread and butter of several manufacturing companies. Production of the Noratlas twin-boom cargo aircraft represents the largest transport project which the industry has ever undertaken.

At the beginning of this month, 181 of these aircraft (Nord 2501) had been delivered to the Air Forces of France, Germany and Israel. Of the civilian version (Nord 2502), seven are used in Central Africa by UAT-

special highlift devices is presently flight-tested.

Holste, with the backing of most French airlines, is now developing a bigger aircraft, the MH 250 Super Broussard, a feeder liner carrying 17 passengers whose prototype should begin its test flying during the autumn: Turboprop developments of this aircraft can be foreseen.

Another French transport prototype, the twin-jet Dassault "Méditerranée" business aircraft, which will accommodate seven or eight passengers is also scheduled to fly before the end of this year. A private venture of Dassault, the Méditerranée differs in shape from the Lockheed Jetstar only in the positioning of its engines, Dassault-made too (Farandole), slung in pods under the wings.

However, as noted, the main accent in the production of transport aircraft is being put on the Caravelle jetliner which is now reaching the production stage. The ambition of Sud-Aviation, the nationalized company which, since the merger of Sud-Est and Ouest, employs 22,000, is to balance the Caravelle operation by build-

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The new Lockheed Electras represent a major step in Eastern's \$422,000,000 fleet expansion program, the largest in the history

of commercial aviation. With this program, Eastern will assure travelers the ultimate in piston-engine, prop-jet, and straight-jet air service.

The final phase of Eastern's expansion program calls for 20 straight-jet Douglas DC-8's. Scheduled to begin service in January, 1960, these giant aircraft will carry 120-144 passengers at speeds of 575-600 miles an hour.

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APRIL 21, 1958

Selected Airline Expenditures

Company	Total Assets		Shop and Servicing Supplies		Passenger Food Expenses		Advertising	
	1957	1956	1957	1956	1957	1956	1957	1956
Aerovias Sud	\$1,182,538	\$1,119,899	\$7,242	\$117			\$13,464	
Alaska	NA	3,446,427		42,524			NA	\$104,276
Alaska Coastal	1,042,754	731,699	17,422	13,510		877,167	NA	5,124
Allegheny	3,946,578	3,718,519	61,994	47,468	\$23,342	26,983	147,144	96,281
American	272,810,288	249,311,945	1,864,004	1,830,887	9,124,486	7,894,345	4,480,823	3,444,131
AAICCO	2,157,172						NA	
Bonanza	2,182,543	1,530,998	13,364	15,549	11,145	11,480	100,314	41,558
Brant	61,390,743	83,863,848	NA	275,105	NA	1,753,836	NA	947,416
Byers		88,536		647				748
Capital	87,098,470	94,760,612		435,084		2,413,754	1,484,647	NA
Caribbean	1,047,321	1,064,258	8,948	9,147			1,122	37,199
Central	1,367,943	1,519,421	23,954	4,873	10,872	9,789	61,370	9,185
Chicago Helicopter	2,121,344	1,641,636	15,518	8,674			14,541	14,541
Continental	27,613,923	19,193,221		124,054		386,424	277,445	543
Cordova	NA	488,414	NA	6,179	NA	2,943	NA	
Delta	70,299,631	62,772,844	775,612	642,582	2,990,817	1,641,405	2,491,940	1,445,374
Eastern	217,448,157	202,290,108	1,582,881	1,218,036	4,443,216	5,624,884	6,440,118	4,855,858
Elite	NA	445,452	NA	7,799	NA		NA	15,272
Flying Tigers	31,995,688	24,891,088	159,433	89,042	441,135	1,888	238,328	115,778
Frontier	1,771,443	1,897,000	38,638	48,466	31,281	29,249	204,117	70,428
Hawaiian	4,343,831	4,031,901	28,477	28,444	4,811	9,036	34,674	34,674
Lake Central	1,438,870	1,130,471	33	686	9,321	3,501	23,525	8,431
Los Angeles	1,865,437	1,139,437	7,311	1,523			5,040	3,774
Mackey	2,284,074	NA	NA	15,406			NA	29,739
Mohawk	7,993,330	7,430,547	NA	45,348		25,776	NA	42,840
National	59,816,613	46,264,491	338,383	295,952	1,302,515	1,230,244	2,179,225	1,515,626
New York Airways	2,622,069	2,676,423	13,570	14,893			9,244	3,511
North Central	4,791,148	3,779,183	41,438	20,784	51,145	10,714	139,863	87,318
Northeast	24,644,580	14,465,895	135,808	90,747	389,837	177,104	1,304,892	128,382
Northern Consolidated	1,625,377	1,560,167	NA	17,729	NA	13,813	NA	14,551
Northwest	76,222,234	60,974,046	611,800	561,084	1,998,234	1,713,449	2,253,780	1,241,450
Ozark	2,714,679	2,944,528	89,626	50,552	28,201	14,013	91,538	34,641
Pacific Northern	7,935,183	7,149,283	NA	46,754		225,812	NA	72,219
Pan American	300,000,000*	293,594,475						
Alaska			NA	35,185	NA	144,385	NA	24,175
Atlantic			647,446	441,272	2,578,870	2,236,154	4,187,074	2,093,908
Latin American			310,712	1,007,618	2,222,000	1,929,036	2,770,268	1,051,421
Pacific			NA	461,148	NA	1,247,484	NA	809,264
Non-divisional			NA		NA		NA	
Panagra	25,476,226	25,495,242	NA	52,149	NA	316,813	NA	602,339
Piedmont	3,832,684	4,229,422	NA	32,699	NA	27,546	NA	152,574
Revere	NA	531,395	NA	2,174	NA	8,439	NA	3,561
Reynolds	3,375,749	2,841,184	20	901	17,196			
Riddle	10,179,770	11,061,942	67,275	54,240				
Seaboard & Western	NA	13,649,799	NA					
Slick	NA	19,095,782	NA	388,769	NA	221,391	NA	65,386
Southern	953,353	1,634,261	NA	34,195	NA	9,209	NA	46,779
Southwest (Pacific)	NA	4,095,013	NA	29,780	NA	8,246	NA	82,646
Trans Pacific	1,159,927	788,070	NA	5,731	NA	1,279	NA	17,831
Trans Texas	2,188,841	2,098,580	17,283	31,004	35,344	28,452	177,548	113,344
TWA	253,633,248	195,262,711	1,776,632	1,654,064	4,019,429	5,399,823	7,140,627	3,276,204
United	285,946,150	242,475,595	2,340,304	2,120,597	7,901,635	4,275,489	5,121,779	2,977,160
Western	44,817,874	33,240,798	250,841	181,929	1,891,176	1,186,240	1,095,074	611,528
West Coast	3,975,219	2,818,804	NA	14,435	NA	8,752	NA	88,754
Winn Alaska	1,987,088	1,826,042	15,112	18,751	24,820	26,079	26,714	13,658
TOTALS	\$1,926,768,038	\$1,734,598,470	\$11,231,451	\$12,620,105	\$43,026,775	\$40,782,867	\$44,740,095	\$25,627,011

*Estimated. NA—Not available. NR—Not reported.

Airline assets near \$2 billion; four ca

U.S. scheduled airlines edged up close to \$2 billion in total assets at the close of 1957.

Statistics compiled by AMERICAN AVIATION from Civil Aeronautics Board reports for 1957 indicated that assets took a healthy jump over 1956. Reports include the activities of trunk, international, local service, all-cargo, Alaskan and territorial carriers.

It should be emphasized, however, that CAB introduced major changes in its statistical reporting methods in 1957, and that figures may not be directly comparable with 1956 results in all cases.

The general trend, however, would seem to be

that certain major expenses are continuing to increase rapidly. American Airlines, for example, with a very small increase in total employment, showed a \$6.5 million jump in payroll.

United Air Lines' total payroll also increased substantially. TWA showed an increased payroll despite a decrease in employment.

Eastern, completing its first full year after taking over Colonial Airlines, also had a big payroll jump.

Annual payrolls of TWA, American and United were each substantially over the \$100-million mark. If all divisions of Pan American World Airways are included (two had not filed with CAB

AMERICAN AVIATION

Expenditures for 1956 and 1957

1956	Other Promotional Publicity Expenses		Employment		Annual Payroll		Average Wage		Company
	1957	1956	1957	1956	1957	1956	1957	1956	
\$4,496	NA	\$16,606	166	125	NR	\$420,485	NA	\$4,945	Aerovias Sud
5,124	1,110	3,924	NA	NA	NA	NA	NA	NA	Alaska
96,201	12,429	13,206	134	NA	\$929,184	NA	\$4,832	NA	Alaska Coastal
66,131	321,034	281,802	847	685	4,588,935	3,407,467	5,418	4,974	Allegheny
NA	NA	NA	20,721	20,463	124,253,747	117,640,959	5,997	5,750	American
41,550	2,171	1,684	159	NA	NA	NA	NA	NA	AAXICO
47,414	NA	24,966	384	4,617	2,062,278	NA	5,371	5,186	Bonams
740	NA	NA	NA	5	NA	22,752,757	NA	4,928	Braniff
NA	63,942	NA	NA	6,892	NA	33,500	NA	4,700	Byers
9,106	214	487	266	221	1,012,985	783,071	3,800	4,871	Capital
16,541	3,089	2,427	435	411	2,246,329	1,995,054	5,164	3,543	Caribbean
543	418	421	122	74	687,667	421,543	5,637	4,854	Central
3,139	9,643	NA	NA	1,397	NA	7,954,142	NA	5,697	Chicago Helicopter
56,374	NA	2,908	NA	58	NA	412,559	NA	7,113	Continental
55,850	53,370	69,732	6,114	5,674	33,476,851	29,576,152	5,475	5,693	Cordova
NA	NA	354,761	16,469	14,320	92,824,108	78,178,708	5,587	5,212	Delta
15,272	NA	NA	102	NA	NA	572,424	NA	5,469	Eastern
15,778	92,778	16,654	1,491	1,452	8,945,450	8,361,340	5,946	5,810	Ellis
70,428	12,048	5,751	719	701	3,783,367	3,539,320	5,262	5,759	Flying Tigers
46,674	23,556	33,495	595	529	3,407,770	2,917,909	4,663	5,048	Frontier
0,431	878	2,058	407	356	2,075,125	1,723,512	5,099	5,515	Hawaiian
3,774	100	1,482	114	110	652,198	539,519	5,721	4,841	Lake Central
9,939	NA	27,651	NA	98	NA	310,728	NA	4,905	Los Angeles
12,840	NA	8,752	NA	604	NA	NA	NA	3,171	Mackey
5,434	137,991	2,671	4,500	4,001	22,987,172	19,546,937	5,090	5,146	Moheawk
3,511	606	55	190	177	1,137,891	948,890	5,090	4,091	National
17,318	24,317	26,483	1,237	977	6,464,233	4,940,512	5,098	5,474	New York Airways
9,382	44,640	6,012	2,113	1,176	10,935,289	5,719,902	5,226	5,077	North Central
6,551	NA	5,555	NA	167	1,239,871	NA	5,175	4,862	Northwest
1,460	105,886	123,504	5,910	5,548	33,701,795	30,454,340	5,703	7,424	Northern Consolidated
4,461	353	2,453	773	684	3,811,558	3,394,514	4,928	5,469	Northwest
2,219	NA	6,503	NA	581	NA	3,497,742	NA	4,964	Ozark
NA	NA	7,864	NA	400	NA	2,770,407	NA	6,020	Pacific Northern
8,175	233,842	303,492	6,667	6,400	36,687,456	33,316,932	5,503	6,926	Pan American
8,990	83,524	93,822	8,126	8,214	42,003,120	37,213,096	5,169	5,266	Alaska
2,564	NA	109,437	NA	3,674	23,699,905	NA	NA	4,773	Atlantic
2,339	NA	NA	NA	1,401	4,477,696	4,477,657	NA	4,396	Latin American
2,574	NA	3,199	NA	842	NA	3,997,834	3,324	NA	Pacific
NA	NA	493	NA	54	NA	404,504	NA	3,339	Non-divisional
NA	NA	NA	NA	126	NA	984,858	NA	4,740	Panagra
NA	4,835	34,269	840	728	4,606,752	3,828,212	5,484	7,223	Piedmont
NA	NA	NA	NA	NA	NA	NA	NA	7,814	Reeve
NA	NA	38,593	NA	1,733	NA	9,645,605	NA	5,259	Resort
NA	NA	2,127	NA	480	NA	2,270,620	NA	NA	Riddle
NA	NA	NA	NA	425	NA	2,296,238	NA	NA	Seaboard & Western
NA	NA	NA	NA	220	NA	1,075,116	NA	5,564	Slick
11,901	NA	33,831	665	480	3,342,131	3,235,755	4,887	4,730	Southern
270,042	11,901	13,523	17,799	19,946	112,254,818	106,541,308	5,056	5,389	Southeast (Pacific)
244,839	270,042	251,806	20,340	19,085	120,102,056	109,723,742	6,307	NA	Trans Pacific
118,311	244,839	42,775	2,808	2,334	15,183,645	12,874,538	5,899	4,750	Trans Texas
754	118,311	29,713	NA	426	NA	2,302,159	5,407	5,291	TWA
2,550	NA	232	NA	281	1,570,090	2,552,822	NA	5,760	United
0.01	5,581	13,075	205	NA	NA	NA	7,498	5,511	Western
								5,404	West Coast
								9,085	Wien Alaska
	\$1,917,812	\$2,095,792	110,633	139,992	\$499,479,083	\$754,290,516			TOTALS

Four carriers top \$100-million payroll

at presstime), that carrier also would surpass \$100 million.

Significant changes will take place in the above columns during the next 12 to 24 months. With the introduction of turbine transports, the industry's assets will jump. Shop and servicing supplies will increase. Employee wages can also be expected to continue the upward trend.

One area of expense—that of food expense—is an exception and how it will be affected by the jets remains to be seen.

Some officials believe the faster flight times will reduce the number of elaborate meals that must be served. Others, however, see a likelihood that total

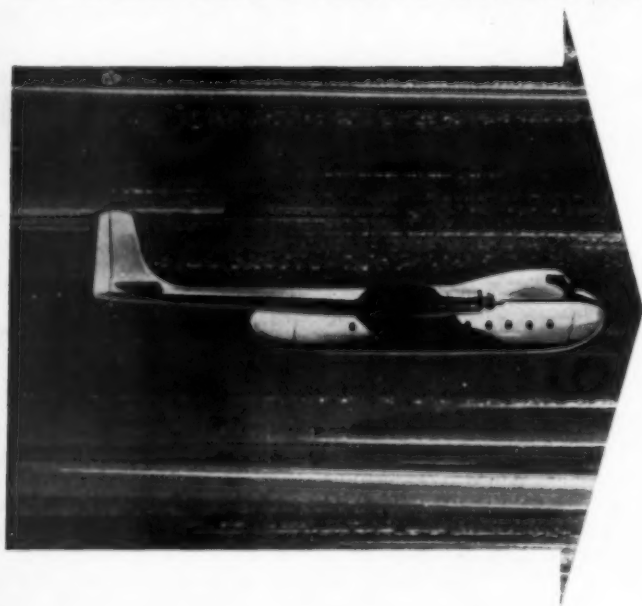
APRIL 21, 1958

cabin service costs will continue to rise.

Kenneth Parratt, director of Pan American World Airways' passenger service, said recently at a PAA jet seminar that there was a possibility that food expense per passenger-mile might drop a little with the jets.

But Parratt warned that "it is not strictly a matter of food cost alone." He added: "As soon as you get into elaborate food services, you require additional cabin attendants, and crew costs involve a lot of things besides the salary expense . . ." The net of it, explains Parratt, is that all these things make their contribution and, in the final analysis, undercut the whole concept.

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The AW 650 Freightercoach is a truly modern answer to world airfreight problems. It is robust, reliable and easy to maintain, and will achieve a substantial reduction of present airfreight costs.

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PAYLOAD	28,000 lb.
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SPEED	300 m.p.h.
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Money squeeze clouds jet picture

by Selig Altschul

A FINANCIAL SQUEEZE may be in the making for many of the trunk airlines as they prepare to accept delivery of new aircraft on order.

The sharp drop in airline earnings last year, and continuing through the early months of 1958 has, of course, weakened the financial position of the industry.

An ironic, vicious circle has also been brought into being, compounding the airline financial problem, as a result of the Civil Aeronautics Board policy of route over-certification throughout the country.

Layers of competitive services have been created by rapid strokes of the CAB pen. Those carriers who have received route extensions are naturally pleased, while those with more competition on their backs are unhappy.

Such intense competitive conditions make it mandatory for each airline to place itself in the strongest possible marketing position. This, in turn, requires additional equipment to service new routes and not give ground in existing schedule patterns.

More aircraft mean substantial new capital expenditures. While this appears to be a happy circumstance for the aircraft builders, the requirement remains for financing.

And the ability to finance must rest on the solid foundation of earning power. Yet, by its liberal over-certification of the air transport network, the Board, which created this greater demand for competitive aircraft, has at

the same time weakened the earning power of the air transport industry.

The Board has declared that its new route awards will create additional business and divert but little traffic from prevailing operations. This theory has been proved fallacious. Instead, traffic has been thinned out, and overall load factors reduced to disturbing levels.

Leverage in airline operations remains a key element in determining profitability. In other words, once break-even points are reached, the major portion of all additional revenues generally tend to flow through to net. Further, the measure of debt imposes relatively large prior charges on operating revenues, thus compounding the leverage factor.

Leverage, in its various forms, causes earnings to mount very rapidly during periods of rising traffic volume. But leverage has a nasty habit of operating in reverse as well. A wide segment of operating costs does not permit material cutbacks in periods of declining business. Hence, considerable instability in airline operations occurs as declines in traffic tend to magnify earnings' shrinkage.

Were it not for the extensive over-duplication of route mileage by the Board, it is a fair surmise that earnings of the industry would have been sustained, or at least not declined as sharply as they have. Certainly, fare increases up to 15% and more would not now be pressed by the carriers.

Paradoxically, the Board's own

petard is being placed under the airlines. In recent observations, the Board has accused the industry of over-scheduling and having too low load factors. Yet, in a competitive struggle, no single airline is going to willingly default the smallest share of its present markets to any newcomers. Nor will it fail to challenge prevailing carriers in new markets to which it, in turn, may have been certificated.

While the growth factor remains in air transportation, it is not great enough to absorb all the new route mileage created by the Board.

The accompanying table reveals significant elements in the year-end financial positions of the domestic trunk airlines in relationship to their separate outstanding net equipment commitments.

Not a single airline has all the jet aircraft on order it feels necessary in the competitive struggle ahead. In one instance (Northwest), not even jets for the "first round" have as yet been ordered. (Northwest, however, has announced its intention of placing an order in the current quarter).

With military aircraft delivery pressures abated, commercial commitments are likely to be accelerated ahead of original target schedules by the builders. In some instances, this will confront obligated airlines with the problem of paying for their equipment earlier than anticipated.

The airlines, in making their plans

Year-end selected financial data, domestic trunk airlines

	Equipment commitments net (thousands)	Total assets (thousands)	Long-term debt (thousands)	Net worth (thousands)	No. of common shares	Book value per share	Market price April 7, '58	Ratio market/ book
American	\$200,000	\$285,285	\$68,145	\$130,137	8,625,879 ¹	\$15.09	15.625	1.04
Braniff	48,900	59,066	15,000	34,919	2,948,119	11.85	8.50	.72
Capital	60,000(A)	86,968	50,618	12,997	909,559	14.29	14.25	1.00
Continental	43,275	27,904	16,756	8,005	743,551	10.77	6.625	.62
Delta	95,182	69,189 ²	19,800 ²	34,485 ²	1,122,000	30.74 ²	18.75	.61
Eastern	280,000	219,024	75,000	102,149	2,921,337	34.97	32.25	.92
National	69,060	59,897	5,438	24,983	1,044,977	23.91	14.625	.61
Northeast	17,500	24,645	10,374	7,565	1,773,688	4.27	5.25	1.23
Northwest	21,150	76,222	27,000	33,065	1,343,120	24.05	12.875	.54
TWA	325,000(B)	253,609	63,171	111,930	6,674,113	16.77	12.125	.72
United	277,900	285,906	93,328	117,772	3,460,810	33.96	23.625	.70
Western	26,000	44,017	16,827	17,469	848,541	20.59	19.75	.96

NOTES: ¹ Assumes conversion of preferred stock. ² As of September 30, 1957.

(A) Represents 15 Convair 880s ordered after Dec. 31, 1957.

(B) Estimated value of equipment ordered by Hughes Tool Co. and assignable to TWA.

SOURCE: Company reports.

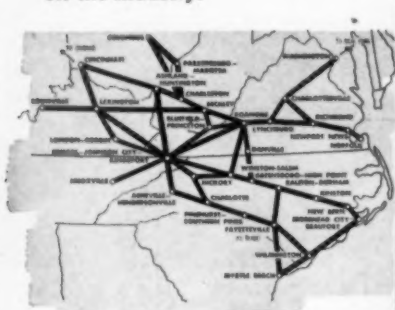


PIEDMONT AIRLINES... on the Threshold of a New Era after a Decade of Progress

Within a few months, Piedmont Airlines will inaugurate F-27 Pacemaker service on its system. This new Fairchild-built plane, powered by world-famous Rolls Royce Dart prop-jet engines, will bring the most modern air transportation to cities along Piedmont's 3,290-mile route.

Introduction of F-27 Pacemaker service will come just slightly more than 10 years after Piedmont first started passenger service. Since that first passenger boarded the airline on February 20, 1948, more than two and one-half million passengers have been carried. A record 433,554 passengers were carried by Piedmont in 1957. Load factor for the year was 53.71.

Important to Piedmont's progress in 1957, as in the previous nine years, was a fine interline relationship. Piedmont's contribution to the continued growth of interline business will be aggressive promotion of the benefits of air travel and a flight service reflecting credit on the industry.



PIEDMONT Airlines

Home Office and Operations Base, Smith Reynolds Airport
WINSTON-SALEM, NORTH CAROLINA

to pay for the equipment on order, intended to obtain the necessary funds from the following general sources:

- Retained earnings.
- Internally generated cash from depreciation and related charges.
- Sale of surplus equipment.
- Additional debt.
- Additional equity.

Earnings are vital, not only in themselves as a source of cash, but in establishing a record to support attracting additional debt and equity.

Depreciation charges have figured prominently in throwing off cash to retire old debts and to finance new equipment. For example, in 1957, Eastern generated some \$28.8 million from depreciation and amortization and only \$9.4 million in net earnings. However, as a result of mandatory revisions in the uniform system of accounts for air carriers, with some changes made effective as of Jan. 1, 1957 and others on Jan. 1, 1958, the rates of depreciation and amortization charges for all airlines have been reduced. This, of course, hurts the amount of cash that can be currently generated from this source.

A major source of funds was built up on the sale of aircraft to be declared surplus as the new equipment was to be delivered. Residual values of aircraft, a few years ago, commanded some very fancy prices. For example, DC-4s sold at \$600,000 and higher. This tended to place high expectations on the prices anticipated from the disposition of all used transport aircraft. The surplus transport aircraft market has virtually collapsed. Hence, funds formerly projected so as to be derived from this source have had to be revised sharply downwards.

While many of the airlines have arranged various forms of debt financing, these loans are linked to definite protective features such as specified equity and working capital coverage. Depending on the rate of pay-out and other elements, it is unusual for the debt of a company to exceed that of its net worth. (Capital's high debt/equity ratio may be justified by its principal creditor as being protected by the attendant chattel mortgage and rapid pay-out schedule).

In many instances, where lines of credit have been established, the airlines involved cannot draw down the full amount of the funds until certain conditions have been fulfilled. This largely centers around building net worth positions up to certain levels, or at a specified ratio to debt. Hence, in some cases, it can be misleading to assume that, where credits have been granted, they necessarily are or will be soon available to the would-be borrower.

Ultimate support rests on an adequate equity or net worth base. This is where earnings leave their final impact, not only in adding to the net worth, but making it possible to attract new equity funds.

Under present circumstances, airline finances are indeed in a tight squeeze.

Scheduled Airline Revenues and Expenses, 1956-1957

Carrier	Passenger Revenues 1956	Freight Revenues 1956	Express Revenues 1956	U.S. Mail Revenues 1956	Total Operating Revenues 1956	Total Operating Expenses 1956	Net Operating Income 1956
DOMESTIC							
American	\$ 285,530,721	\$ 17,574,060	\$ 3,193,950	\$ 4,733,672	\$ 299,915,577	\$ 285,910,459	\$ 17,005,117
Brantford	41,338,678	1,484,525	1,015,000	1,486,067	46,183,994	44,769,323	3,414,671
Capital	99,647,034	4,082,422	880,474	1,305,015	106,015,945	104,018,817	2,997,128
Colonial	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Continental	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Delta	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Eastern	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Northwest	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Trans World	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
United	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Western	1,446,814	1,446,814	880,474	1,305,015	1,446,814	1,446,814	0
Totals	\$ 1,446,814	\$ 1,446,814	\$ 880,474	\$ 1,305,015	\$ 1,446,814	\$ 1,446,814	\$ 0
INTERNATIONAL							
American	\$ 4,902,358	\$ 762,262	\$ 1,941	\$ 54,716	\$ 6,040,019	\$ 5,930,140	\$ 1,099,879
Brantford	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Capital	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Colonial	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Continental	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Delta	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Eastern	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Northwest	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Trans World	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
United	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Western	4,902,358	762,262	1,941	54,716	6,040,019	5,930,140	1,099,879
Totals	\$ 4,902,358	\$ 762,262	\$ 1,941	\$ 54,716	\$ 6,040,019	\$ 5,930,140	\$ 1,099,879
LOCAL SERVICE							
Allegany	\$ 1,138,148	\$ 125,464	\$ 49,275	\$ 99,275	\$ 1,392,162	\$ 1,392,162	\$ 0
Altoona	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Brantford	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Capital	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Colonial	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Continental	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Delta	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Eastern	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Northwest	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Trans World	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
United	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Western	1,138,148	125,464	49,275	99,275	1,392,162	1,392,162	0
Totals	\$ 1,138,148	\$ 125,464	\$ 49,275	\$ 99,275	\$ 1,392,162	\$ 1,392,162	\$ 0
HELICOPTERS							
Chl. Helicopter	\$ 273,237	\$ 4,305	\$ 116,348	\$ 116,348	\$ 493,938	\$ 493,938	\$ 0
Los Angeles	273,237	4,305	116,348	116,348	493,938	493,938	0
N.Y. Airways	273,237	4,305	116,348	116,348	493,938	493,938	0
Totals	\$ 273,237	\$ 4,305	\$ 116,348	\$ 116,348	\$ 493,938	\$ 493,938	\$ 0
TERRITORIAL							
Caribbean	\$ 1,799,449	\$ 1,446,862	\$ 4,146,761	\$ 4,146,761	\$ 11,443,873	\$ 11,443,873	\$ 0
Hawaiian	1,799,449	1,446,862	4,146,761	4,146,761	11,443,873	11,443,873	0
Trans Pacific	1,799,449	1,446,862	4,146,761	4,146,761	11,443,873	11,443,873	0
Totals	\$ 1,799,449	\$ 1,446,862	\$ 4,146,761	\$ 4,146,761	\$ 11,443,873	\$ 11,443,873	\$ 0

* Indicates preliminary figures for 1957. * Indicates preliminary figures for 1956.

* Colonial's 1956 figures are for five months; Colonial & Eastern merged June 1, 1956.

* Western International figures are for six months; started Mexico operations, July 1957.

***Western operations suspended from January 9, 1956 to March 22, 1956, because of strike.

U.S. Airline Transports

OPERATOR	Boeing	Convair		Curtiss	Douglas					Grumman	Martin		Lockheed			Vickers			Total	
	377	240	340 440	C-46	DC-3	DC-4	DC-6	DC-6A/B	DC-7	DC-7B/C	G-21	202	404	049	749	1049	1649	Vis-count		Msc.
AAXICO				40																40
Aerovias Sud				6																6
Alaska Airlines				3	1	3		1							2					10*
Alaska Coastal											9								9 ¹	18
Allegheny					15							7								22
American		59					50	35	58											202
Bonanza					10															10
Braniff			31	2	23		9			7				2						74
Capital					20	14								12				59		105
Caribbean-Atlantic					5															5
Central					13															13
Chicago																			9 ²	9
Continental			9		13			5		4										31
Cordova				1	2														9 ³	12
Delta			28	5	15		7		21					4						80
Eastern			20			1				31			57		18	38				165
Ellis											9								2 ⁴	11
Flying Tiger				11				2								12				25
Frontier					16															16
Hawaiian			5		8			1												14
Lake Central					10															10
Los Angeles																			7 ⁵	7
Mackey					2	3														5
Mohawk		11			10															21
National			18				4	8	4	4						4			10 ⁶	52
New York																			9 ⁷	9
North Central					26															26
Northeast		6			11			10												27
Northern Consol.					4														10 ⁸	14
Northwest	9				5	11		17		9										51
Ozark					20															20
Pacific Air Lines					10							7							1 ⁹	18
Pacific Northern					4	2									4					10
Pan American	24	5			3	25		49		36										142
PANAGRA					4	2	5	5		5										21
Piedmont					21															21
Reeve				1	2	1					1								2 ¹⁰	7
Resort						9									2					11
Riddle				34		4														38
Safeway																				**
Seaboard & Western				2		4										10				16
Slick						7		5												12
Southern					13															13
Trans Caribbean				2		3		3												8
Trans World						8					11	37	32	39	37	25			11 ¹¹	190
Trans-Pacific					8															8
Trans-Texas					20															20
United			55			6	42	42	40											185
West Coast					14															14
Western		9			5			21												35
Wien Alaska				4	3														11 ¹²	18
	33	90	166	111	336	103	117	204	123	96	19	25	94	50	63	103	25	59	80	1897

* Also operates single-engine ski and float equipment.

** Operates unspecified number of Grumman G-21s, Piper Apaches, Piper Pacers, Piper Super Cubs and Stinsons.

¹ 2 PBVs; 1 Lockheed Vega; 1 Bellanca; 2 Pacers; 1 Cessna 195; 1 Cessna 180; 1 Hiller H-12C.

² 1 Bell 47G; 3 S-55s; 3 S-58s.

³ 2 Cessna 180s; 3 Cessna 170s; 2 Grumman G-21s; 2 Piper Super Cubs.

⁴ 2 Cessna 180s.

⁵ 2 S-51s; 5 S-55s.

⁶ 10 Lockheed Lodestars.

⁷ 5 S-55s; 3 S-58s; 1 Bell 47H.

⁸ 10 Cessna T-50s.

⁹ 1 Lockheed 12A.

¹⁰ 2 Sikorsky S-43s.

¹¹ 1 Fairchild C-82.

¹² 5 Noorduyns; 2 Cessna 195s; 3 Cessna 170s; 1 Cessna 180.

Industrial funding reshapes MATS management

by Gerald Fitzgerald

INDUSTRIAL FUNDING, a type of monetary management and control frequently applied to military industrial functions in recent years, will capture another reluctant military agency next July 1 when Military Air Transport Service must try to begin operating like a commercial airline.

This concept, which has been in existence almost since the birth of the Defense Dept., has been widely used in industrial-type activities in the military departments. It was authorized by an amendment to the National Security Act in 1949.

Navy shipyards and Army ordnance operations, for the most part, operate under one of these revolving industrial funds. The idea is to make "empire-building" or overlapping defense functions operate like businesses, within limitations, and to prevent government from competing with business.

In all fairness to MATS and the commercial airline industry, it must be stated that MATS will resemble a commercial airline only in the finicky attention it must now pay to its costs.

MATS will still lack the control and management privileges that norm-

ally accompany efficient commercial operations. Nor will MATS costs be in any way comparable to those of the commercial carriers. Operating costs alone are included.

Air Force officials have questioned the principle behind industrial funding as applied to MATS since introduction of the idea several years ago. An industrial fund applied to army textile services, or even the Military Sea Transport Service, must be somewhat different in character from one used to control MATS. Neither of these services must respond to quite the same sort of a need that will require MATS to go into action, nor must they be able to do so as quickly.

Should help 'customers'

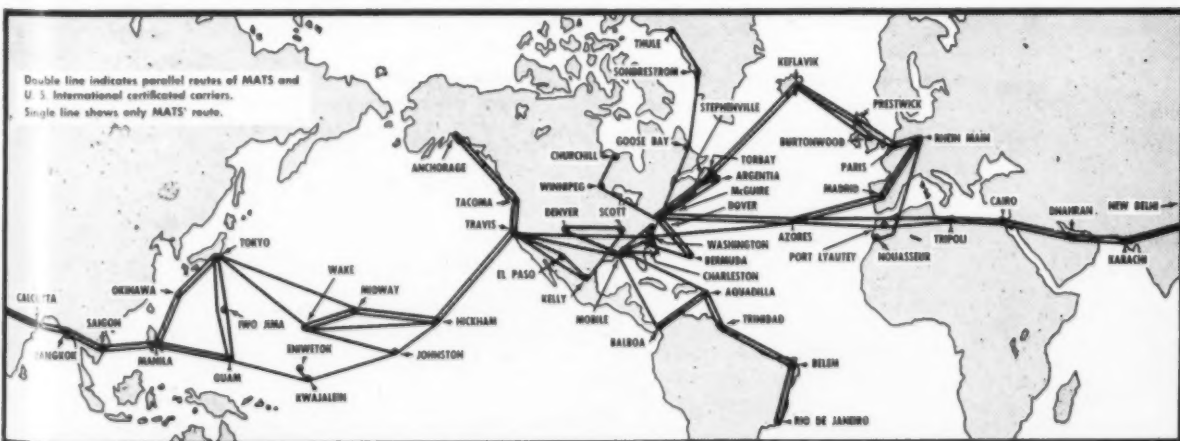
Funding, on the other hand, offers some distinct advantages for both the military user and the operator. The new system, say MATS planners, should allow MATS in many ways to better serve its "customers." Under pure appropriations methods, funds are more difficult to come by to meet critical traffic needs than under an industrial fund.

To illustrate: When Strategic Air Command goes on an exercise and uses all or a great portion of MATS available airlift, normal MATS traffic literally ceases. This may be for only a short time, but the rate for aircraft out of commission waiting parts goes up, to mention only one unsatisfied need. Under industrial funding, MATS will be able to buy more commercial airlift to maintain its schedule frequency and constant lift capability.

MATS' "customers," the other government agencies, paradoxically are not free to choose between MATS' services and those of a commercial carrier with parallel routes. They are captive customers. However, these customers, even though "captured," will have considerably more latitude to demand service to suit their needs. MATS' tariff rate will probably be lower than comparable commercial rates as well.

The funding program, as it is presently constituted, is a cost-accounting system designed specifically for government operations. In this case, the purpose is to fix the unit costs of carrying MATS traffic, possibly to control the amount of traffic as well as the cost of

How MATS routes parallel airlines around the world



MUCH CONCERN has been expressed by the civil transport industry during the past few years over the duplication of civil air routes by the Military Air Transport Service. This MATS system-map, upon which have been imposed double lines, indicates where MATS international routes duplicate existing civil routes. Only MATS routes are shown. In many cases, civil carriers can provide the same service to points served by MATS over slightly different routes. For instance, Northwest Airlines serves Tokyo, directly from Seattle. Pan American serves Tokyo also, either directly from Honolulu, or via Midway, Wake and Guam.



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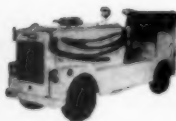
The increasing use of 400 cycle power in aircraft—both military and commercial—has created a need for closely regulated, dependable 400 cycle generators of the industrial type. Hobart meets these needs with the following complete lines for ground tests and checks.



Electric Motor Driven: Induction motor driven 400 cycle generators with capacities of 3 to 30 KW. Synchronous motor driven generators with capacities of 5 to 100 KW. Furnished complete with all controls and instruments. Ideal for hanger, test line, or missile launchers.



Gas Engine Driven: Commercial and military models are in production. 400 cycle AC generators with capacities from 10 to 60 KVA, gas engine driven. 75 and 90 KW with Diesel engine drive.



Self-Propelled: For busy airports and test areas, this self-propelled design saves space and time. 400 cycle AC generators of this type are available in the same capacities as trailer type above.



Combination AC-DC generators also available: (unit illustrated has a capacity of 30 KVA 400 cycle AC and 6 KW 28 volt DC). If you have special requirements for both 400 cycle AC and 28 volt DC from the same unit, you'll probably find Hobart has a unit already designed close to your requirement. If not, we will be glad to work with you to get exactly what you need.

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DC



A dependable source of regulated 28 volt DC power is still required for many commercial and military aircraft and missile applications. Hobart generators, designed for the specific job you have, gives you many time and cost saving advantages.



Electric Motor Driven: Capacities of 50 to 1500 amperes at 28 volts DC. Also available with current limiting or constant current features for jet engine starting. For use where electric power is available. Low cost—dependable.



Gas Engine Driven: Capacities of 200 to 1500 ampere for jet or reciprocating engine starting and aircraft testing. For flight line use away from electric power. Complete with all controls, DC cable and portable mounting.



Self-Propelled: This maneuverable ground power generator gets to the job under its own power. Saves cost and maintenance of separate tractors. Capacities of 600, 1000, 1500 amperes are in standard production.

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carrying. Capital costs are not included in the accounting to prevent the organization from becoming self-generating. This modification accounts largely for the dissimilarity between funding and a normal cost-accounting system.

Costs which MATS will recoup from other government agencies are

MATS equipment inventory

Aircraft type	Number of units	% of MATS total
Passenger		
C-97	12	...
C-118	74	...
R7V	28	...
Subtotal ...	114	27%
Cargo		
C-97	28	...
C-124	144	...
C-54	79	...
R6D	24	...
Subtotal ...	275	66%
Passenger-cargo		
C-121	28	7
Total	417	100%

NOTE: These figures do not include those aircraft assigned to training activity (TTU) at West Palm Beach, Fla. consisting of four C-54s, four C-118s, four C-97s and seven C-124s, nor do they reflect the phasing out of all C-54 aircraft, slated for completion later this year. Replacement aircraft will be 50 Douglas C-133 turboprops.

those spent for fuel, commercial augmentation, civilian pay and allowances, change of station of civilian personnel, commercial transportation of airlift service equipment or personnel, rental of equipment and contractual services.

Other costs which will be recouped are those for maintenance of operation, including field, periodic, flight, contract and depot maintenance, and any temporary duty travel or allowances for military personnel. Costs not to be recouped are military pay and capital costs for equipment.

Foundation for the new system is nearly complete. A common user tariff will be in the hands of MATS' "customers" within a few weeks. Cross-servicing agreements are being drawn

Meet Gen. Tunner, new chief of MATS

Military Air Transport Service will be getting "a new deal" this summer. Along with its new home at Scott AFB, St. Louis, it is getting



GEN. TUNNER

a new commander, Lt. Gen. William H. Tunner, and a new funding arrangement—called the industrial fund.

Gen. Tunner is no stranger to the Air Force's transportation business. He organized and assumed command of the Domestic Wing of the Air Corps Ferrying Command, in 1941.

In 1944, Gen. Tunner became the commanding general of the Indo-China Division of ATC and as such was responsible for the delivery of supplies by air "over the

hump" to Burma and China. Subsequently he served as commander of the Continental Division of ATC and ultimately of the Atlantic Division.

With the creation of MATS, Gen. Tunner became deputy commander for operations and was responsible for the now famous Berlin airlift.

Gen. Tunner, speaking of his new command, said: "I am happy to get back in the transport business."

He added that he hoped that now that he was back in the transport business he would be seeing more of the airline officials with whom he had served and had learned to cooperate. He said he thought military and airlines both helped each other in many ways. And that this process ought to continue for the benefit of all concerned.

up between MATS and other military and Air Force departments which will provide support services to MATS' transport operations. Daily and hourly tariff rates are being worked up to cover special services not covered by MATS' scheduled operations. These might be likened to commercial charter rates.

Proposal before Congress now is for a \$75-million operating fund. Basis for this initial request is the estimate of what the three services will use in airlift. Present estimates are that the fund will revolve about four times annually.

Operating costs, upon which the common user tariff is based, are the "guess-timate," in the words of one AF officer, of what it has cost MATS to operate in the past. Under these conditions, tariff rates, for a time at least, will not remain static.

MATS will try to render a single

rate to the shipper, whether or not it uses its own aircraft or those of commercial carriers. This would be only out of fairness to the shipper. Tariff will be adjusted to provide the proper income to the revolving fund. Estimated cost figures were provided to military users some time ago. These ranged from 18¢ to 18.5¢ per cargo-ton-mile, and from 32.2¢ to 33.7¢ per passenger-ton-mile. These figures were to provide the user agencies with some basis upon which they could predict the funds they would need to satisfy their airlift requirements.

It should be noted that industrial funding is to be applied only to MATS transport activities. Air Weather Service, Airways and Air Communications Service, Air Rescue, Air Photographic and Charting Service and other MATS functions not of a transport nature will continue to be supported by appropriated funds.

MATS NEWEST AND BIGGEST, Douglas C-133A, is in service in limited numbers. MATS expects 50, eventually 100 turboprops.



SERVING THE EAST COAST FROM MONTREAL TO MIAMI

The map shows the following route: Montreal to Boston, New York, Philadelphia, Washington, Jacksonville, St. Petersburg - Clearwater, Tampa, and Miami. A flight attendant in a uniform is shown serving a man and a woman seated next to each other. The man is smoking a cigarette and holding a briefcase. The woman is holding a book. An illustration of a twin-engine propeller airplane is shown in flight above the map.

Northeast is the nation's fastest growing airline. During the past year Northeast has expanded its popular Sunliner flights between New England, the Middle Atlantic States and Florida. This expansion is a fine example of growth and progress built on public preference for courteous and dependable service. And in the years ahead Northeast Airlines will continue to increase its service between cities all along the East coast.

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NORTHEAST AIRLINES

Traffic ratings, U.S. scheduled airlines, 1957

Rank	Airline	Originating Passengers	Rank	Airline	Revenue Passenger Miles (000 omitted)	Rank	Airline	Mail Ton-Miles	Rank	Airline	Express Ton-Miles	Rank	Airline	Freight Ton-Miles
1.	Eastern	8,145,138	1.	American	5,142,594	1.	PanAmerican	31,213,926	1.	United	9,552,104	1.	PanAmerican	96,594,104
2.	American	7,649,153	2.	United	4,868,306	2.	United	26,238,388	2.	American	9,003,988	2.	American	86,063,689
3.	United	6,293,653	3.	Eastern	4,815,246	3.	Trans World	20,850,372	3.	Trans World	7,345,486	3.	Flying Tiger	82,986,099
4.	Trans World	4,817,764	4.	Trans World	4,396,498	4.	American	17,911,668	4.	Eastern	5,297,267	4.	United	57,450,315
5.	Capital	3,949,844	5.	PanAmerican	3,876,073	5.	Northwest	16,727,002	5.	Delta	2,881,983	5.	Slick	49,799,653
6.	Delta	2,723,132	6.	Capital	1,513,845	6.	Eastern	9,555,251	6.	Northwest	2,703,169	6.	Trans World	34,268,074
7.	PanAmerican	2,661,169	7.	Delta	1,401,049	7.	Delta	3,919,633	7.	Capital	2,373,007	7.	Riddle	31,554,761
8.	Braniff	2,047,875	8.	Northwest	1,247,865	8.	Capital	3,574,984	8.	Braniff	1,419,089	8.	Seaboard &	
9.	Northwest	1,493,930	9.	Braniff	962,987	9.	Braniff	3,351,774	9.	Western	1,065,196	9.	Western	17,938,744
10.	National	1,430,037	10.	National	953,260	10.	Western	2,097,231	10.	Slick	719,285	10.	Northwest	17,097,443
11.	Western	1,379,650	11.	Western	702,727	11.	National	1,772,215	11.	National	660,509	11.	Eastern	16,765,965
12.	Continental	828,659	12.	Continental	363,254	12.	Pac. Northern	1,120,959	12.	Continental	457,645	12.	Delta	9,608,457
13.	Northeast	764,882	13.	Northeast	246,095	13.	Continental	1,023,538	13.	Flying Tiger	422,116	13.	Aerovias	8,848,739
14.	No. Central	658,810	14.	Panagra	173,736	14.	Panagra	740,605	14.	North Central	364,478	14.	Braniff	5,948,866
15.	Allegheny	440,389	15.	No. Central	106,723	15.	Alaska	592,144	15.	Riddle	323,532	15.	National	5,561,563
16.	Mohawk	418,341	16.	Pac. Northern	105,820	16.	Wien Alaska	398,752	16.	Northeast	248,591	16.	Panagra	4,533,261
17.	Hawaiian	416,524	17.	Piedmont	83,808	17.	Northeast	355,095	17.	Allegheny	202,791	17.	Capital	4,516,907
18.	Piedmont	461,168	18.	Mohawk	81,405	18.	No. Consol.	277,202	18.	Ozark	186,102	18.	Alaska	3,791,202
19.	Ozark	390,753	19.	Allegheny	77,011	19.	Reeve	195,789	19.	Aaxico	171,791	19.	Pacific	
20.	Pacific(SWA)	337,200	20.	Pacific(SWA)	72,994	20.	No. Central	191,862	20.	Mohawk	160,926	20.	Northern	2,984,863
21.	West Coast	254,062	21.	Ozark	63,835	21.	Flying Tiger	178,404	21.	Lake Central	160,526	21.	Western	2,930,684
22.	Trans Texas	243,348	22.	Hawaiian	62,907	22.	Riddle	161,139	22.	Southern	129,797	22.	Wien Alaska	2,472,488
23.	Caribair	226,501	23.	Frontier	59,343	23.	Trans Texas	137,689	23.	Piedmont	115,884	23.	Aaxico	2,335,399
24.	Frontier	219,360	24.	Trans Texas	55,330	24.	Frontier	122,152	24.	Trans Texas	95,785	24.	Continental	1,560,822
25.	Southern	211,916	25.	West Coast	45,128	25.	Ozark	117,004	25.	Frontier	91,389	25.	Cordova	1,439,232
26.	Trans Pacific	180,168	26.	Southern	38,318	26.	Southern	105,722	26.	Pacific(SWA)	54,949	26.	Hawaiian	1,427,977
27.	Lake Central	160,784	27.	Bonanza	33,044	27.	Slick	100,654	27.	Bonanza	27,829	27.	No. Consol.	873,238
28.	Bonanza	150,423	28.	Trans Pacific	28,192	28.	Piedmont	98,259	28.	Central	26,543	28.	Frontier	745,782
29.	Panagra	139,409	29.	Lake Central	25,349	29.	Allegheny	96,940	29.	West Coast	25,663	29.	Northeast	645,494
30.	Central	118,867	30.	Alaska	25,333	30.	Pacific(SWA)	93,401	30.	Los Angeles	22,511	30.	Reeve	377,877
31.	Pac. Northern	107,875	31.	Central	23,726	31.	Mohawk	63,871	31.	N.Y. Airways	11,407	31.	Trans Texas	281,706
32.	N.Y. Airways	88,060	32.	Caribair	16,048	32.	Hawaiian	48,530		Aerovias		32.	Mohawk	250,624
33.	Ellis	63,168	33.	Wien Alaska	9,621	33.	Alaska Coast	48,116		Alaska		33.	Allegheny	171,431
34.	Alaska	62,943	34.	Reeve	7,027	34.	Los Angeles	46,415		Alaska Coast		34.	Piedmont	167,511
35.	ChiHelicopter	55,310	35.	North. Conso.	6,630	35.	Central	43,790		Caribair		35.	Ozark	163,434
36.	Alaska Coast	51,841	36.	Cordova	5,135	36.	Cordova	42,856		Chi.		36.	Trans Pacific	126,947
37.	Los Angeles	31,283	37.	Alaska Coast	4,629	37.	West Coast	42,084		Helicopter		37.	Central	86,383
38.	Wien Alaska	28,413	38.	Ellis	3,382	38.	Bonanza	31,640		Cordova		38.	Pacific(SWA)	78,992
39.	North. Conso.	20,446	39.	N.Y. Airways	1,276	39.	Lake Central	30,541		Ellis		39.	Bonanza	74,419
40.	Cordova	19,738	40.	Los Angeles	1,131	40.	ChiHelicopter	26,412		Hawaiian		40.	West Coast	59,983
41.	Reeve	8,297	41.	ChiHelicopter	895	41.	Ellis	24,049		Northern		41.	Alaska Coast	48,425
	Aaxico			Aaxico		42.	N.Y. Airways	19,360		Consolidated		42.	Caribair	39,290
	Aerovias			Aerovias		43.	Caribair	18,300		Pacific		43.	Ellis	32,545
	Flying Tiger			Flying Tiger		44.	Trans Pacific	14,368		Northern			New York	
	Riddle			Riddle			Aaxico			Pan American			Airways	7,037
	Seaboard &			Seaboard &			Aerovias			Panagra			Southern	2,638
	Western			Western			Seaboard &			Reeve			ChiHelicopter	
	Slick			Slick			Western			Trans Pacific			Lake Central	
							Wien Alaska						Los Angeles	
													North Central	
TOTAL ...		49,670,893	TOTAL ...		31,707,677	TOTAL ...		143,823,086	TOTAL ...		46,351,347	TOTAL ...		552,713,052

NOTES: In above tabulations, domestic and international operations of companies are combined. Figures include both scheduled and non-scheduled operations. Mail ton-miles include air parcel post and first class mail carried by air.

The big shift in the position of U.S. airlines in 1957 was the displacement by Eastern Air Lines of American as the front-runner in the number of passengers carried.

While American was feeling the bite of increased competition and dropped from 7,845,267 passengers in 1956 to 7,649,153 last year, Eastern showed a marked gain. From 7,673,411 passengers in '56 it registered 8,145,138 to take over the No. 1 spot.

In other changes among the top 10 carriers in the passenger column, Delta moved steadily ahead and passed Pan American to hold down the No. 6 position.

Northwest moved ahead of National to occupy the No. 9 ranking, although this presumably is more a reflection of NAL's service stoppage during the year due to labor problems than of any influence.

In revenue passenger-miles flown, Capital Airlines made the big impression with a move from No. 8 to No. 6

spot. Displacing both Delta and Northwest, it increased its passenger-miles from 1,021,564 in 1956 to 1,513,845.

Here again the effects of shutdown were felt by National as it surrendered the No. 9 ranking to Braniff and moved into the No. 10 spot.

In mail ton-miles, Capital again made inroads into the competition by moving from No. 9 ranking in 1956 to No. 8 last year. Here, National dropped out of the first 10 category, giving way to Capital, Braniff and Western.

Significant traffic figures in this area showed United dropping from 28.1 million ton-miles in '56 to 26.2 last year; American from 20.1 to 17.9 million; TWA from 22.2 to 20.8 million, while Pan American increased from 30.5 to 31.2 million.

In express ton-miles, it was United, American, TWA, Eastern and Delta holding down the first five places, but all showed declines from their 1956 performance. Only change in this first-10 lineup was the displacement of Na-

tional by Slick in the No. 10 position.

In freight ton-miles, United made the only gain in rating with a jump from No. 5 position in 1956 to No. 4 last year. However, Slick Airways' decline from 63.5 million freight ton-miles in '56 to only 49.8 last year provided the real explanation.

United actually gained from 50.9 to 57.5 ton-miles during the year, whereas Pan American increased 13.5 million ton-miles, American 11.3 million and Flying Tigers a whopping 15.3 million.

TWA saw traffic in this category increase only slightly from 32.8 million ton-miles in '56 to 34.2 million last year. Northwest slid from No. 7 spot in 1956 to No. 9 last year with a drop from 17.7 to 17.1 million freight ton-miles.

Riddle Airlines moved into No. 7 among the top 10 with 31.5 million ton-miles and Seaboard & Western became No. 8 with 17.9 million.



11:05 a.m. March 6, 1958: Test inflation of Pan Am's giant globe begins at New York's Idlewild Airport.



11:13 a.m. The Pan Am World begins to show signs of life—witnessed by over 200 members of the press.



11:25 a.m. Battery of air blowers pump away at the 100,000-cubic foot structure, now more than half filled.



11:35 a.m. Mission completed: The World is fully inflated. Later deflated, it was shipped by Clipper to Brussels the same day.

How to walk around the world a

From now to October 19, America's colors are flying at the Brussels World's Fair. And never more proudly.

Upwards of forty million people from all over the world are expected to come together in an atmosphere of peaceful interchange. This is a powerful step toward improved understanding among nations.

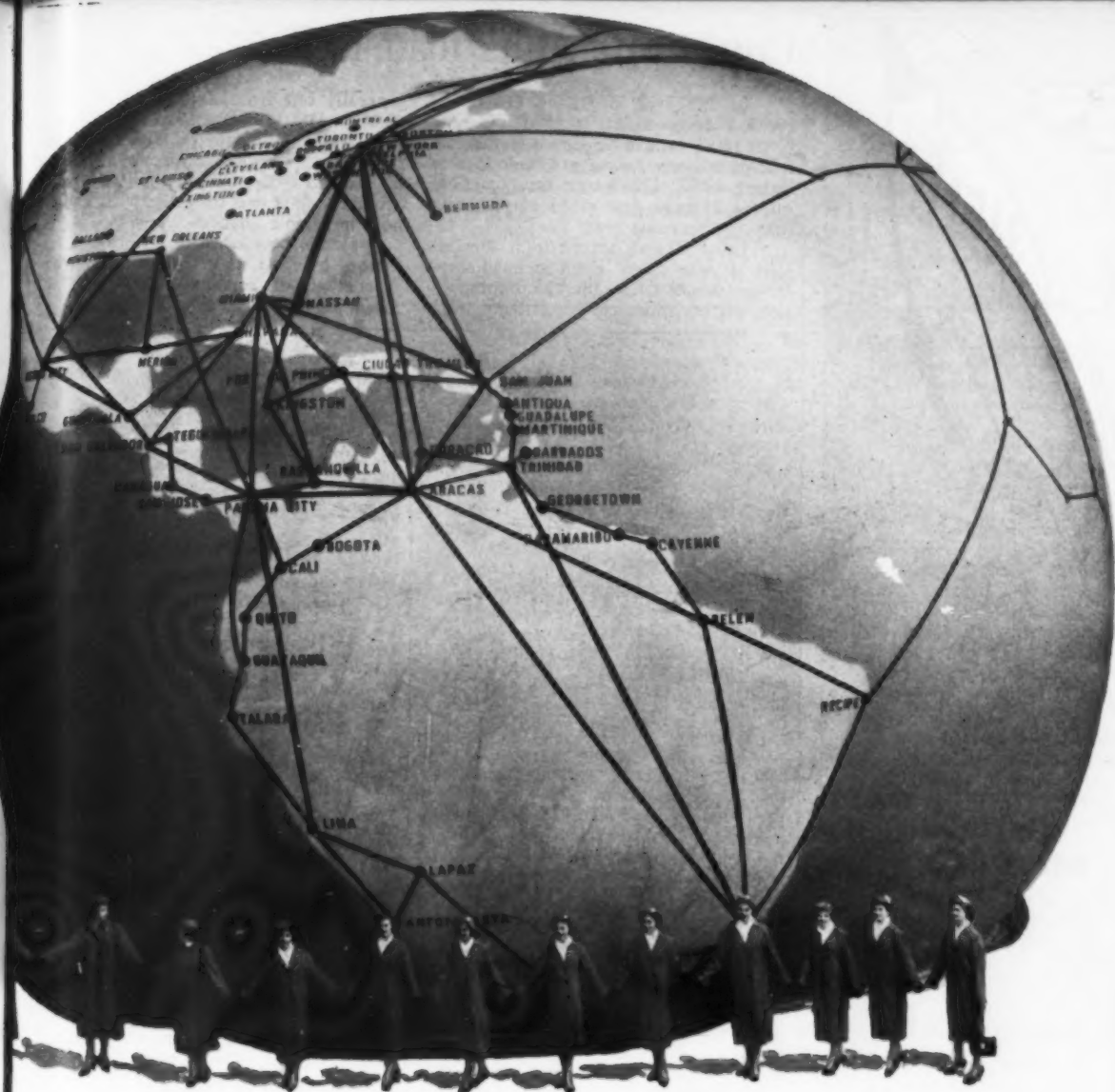
Pan American—the first 'round-the-world airline—believes there is no better way to do this.

Indeed, bringing the peoples of the world together, *face-to-face*, has been Pan Am's most cherished objective in over 30 years of overseas flying.

One million people have crossed this bridge to understanding on the wings of the Flying Clippers*.

Now Pan Am has joined with 50 nations, seven international agencies, public and private organizations of six continents to create the first World's Fair of the Atomic Era. At Brussels, the Pan American World is represented by a gigantic, inflated globe. Built by the Irving Air Chute Co., this nylon globe, 52 ft. in diameter, is the biggest earth on earth! Continental land masses and islands of the world are painted on the outside along with the names of 143 of the cities served by Pan Am.

Inside, 160 visitors at a time will be able to watch a demonstration of astral effects in the "theater of the stars," worked out with the co-operation of the



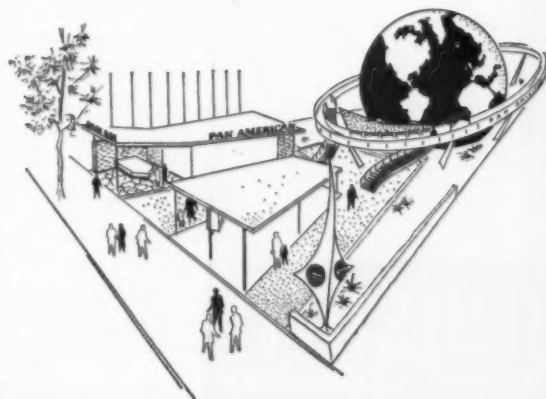
at the Brussels World's Fair

Hayden Planetarium and Spitz Laboratories. A short film will also be shown dramatizing the change from Magellan's 'round-the-world cruise 400 years ago to the Jet Clippers of the first 'round-the-world airline.

After the show, the audience will exit through a door that leads to the "walk around the world" which sweeps out nearly 30 feet to ring the globe, affording an excellent view of the Pan American World and the surrounding fair grounds.

The first responsibility of an airline
is to be a useful citizen

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PAN AMERICAN



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Competition hits load factors

In the face of rising costs, increased competition spurred by new CAB route awards appeared to take its toll of airline passenger load factors during 1957. The result: most carriers on the average flew more empty seats than the previous year.

Load factors except in a few instances were down. Even in local service operations where increased competition has no influence, percentages were

generally off, from 2% to 6%.

In DC-7 operations, American's load factor fell from 68.80% in 1956 to 63%; National's dropped from 69.81% to 64%; United's fell two percentage points and only Delta's showed no appreciable change.

Here's how carriers reported load factors by type of equipment and the percentage of scheduled to available ton-miles operated for the year:

Airline	No. Aircraft	Load Factor %	% Rev. to Avail. ton-miles
BOEING 377			
NWA	9	53.76	43.09
PAA-ALA	2	58.50	52.50
-ATL	8	64.58	67.63
-PAC	14	70.50	66.70
CONVAIR 240			
AA	63	68.10	69.60
MOH	11	46.10	47.30
NEA	6	54.72	55.26
WAL	9	58.44	61.82
CONVAIR 340/440			
BNF	31	58.40	52.70
CAL	9	51.95	44.06
DAL	28	56.80	54.60
EAL	1	72.82	51.86
	20*	55.81	49.55
HAL	5	59.90	55.70
NAL	18	48.00	39.00
UAL	54	56.40	51.90
*Convair 440			
CURTIS C-46/CW20T			
ASA*	3	33.95	47.56
ASA-Int'l**	4		80.90
BNF	2		30.80
DAL	5		39.30
RID	15		68.92
*Alaska Airlines			
**Aerovias Sud Americana			
DOUGLAS DC-3			
AAA	15	52.67	47.01
BAL	10	49.71	43.70
BNF	22	50.30	51.20
CAL	13	47.92	45.38
CAP	20	57.80	50.71
CBA	5	54.10	59.20
CEN	13	33.70	30.10
DAL	15	51.30	56.70
EAL		54.55	49.12
FAL	16	49.90	59.90
HAL	6	54.70	54.60
	2C		63.30
LCA	10	37.30	39.70
MAK	2	37.70	48.70
MOH	10	51.80	51.60
NEA	11	56.67	57.28
NOR	26	45.40	
NWA	5	50.47	45.31
OZA	20	41.15	43.10
PAI	21	53.71	53.34
PAL	11	56.10	
Panagra	4	53.90	61.25
PNA	4	36.00	54.00
SOU	13	39.90	39.10
TPA	8	55.66	57.56
TTA	20	38.40	38.70
WAL	5	51.77	54.41
WCA	14	48.68	45.96
C-Cargo			
DOUGLAS DC-4			
AA	2		68.10
ASA	3	35.83	49.91
CAP	12	50.85	45.09

EAL	5	55.70	56.66
MAK	3	50.90	52.80
NWA	14	51.76	49.96
PAA-ALA	1	72.00	48.80
-ATL	6	75.41	70.82
-LAD	13	52.00	61.00
-PAC	3	70.80	49.90
Panagra	2	49.17	55.35
PNA	2	42.00	52.00
RAL	8	93.39	76.57
RID	3		79.74
TWA	8	60.45	50.63
WAL		69.60	62.75

DOUGLAS DC-6			
AA	50	67.90	65.40
BNF	9	56.20	45.50
DAL	7	65.40	67.40
NAL	4	65.00	54.00
PAA-LAD	4	68.00	64.00
RID			65.73
UAL	42	69.90	65.00

DOUGLAS DC-6A			
AA	10		64.60
NAL	8	61.00	57.00
NEA	10	42.09	33.03
PAA-LAD	2	78.00	77.00
UAL	5C		64.80

DOUGLAS DC-6B			
AA	25	58.70	48.00
CAL	3	65.51	44.28
EAL	6	66.77	62.96
NWA	17	61.49	58.31
PAA-ATL	11	58.52	58.96
-LAD	26	63.00	64.00
-PAC		71.00	68.20
Panagra	5	59.63	60.83
UAL	37	66.40	54.70
WAL	21	60.07	52.66

DOUGLAS DC-7			
AA	56	63.00	52.90
DAL	19	60.60	49.80
NAL	7	64.00	49.00
UAL	47	67.10	52.20

DOUGLAS DC-7B			
CAL	4	50.38	39.23
EAL	29	67.38	46.12
PAA-LAD	8	66.00	60.00
Panagra	5	57.82	60.32

DOUGLAS DC-7C			
BNF	7	60.20	36.50
	3*	64.46	46.77
NWA	8	57.27	69.79
PAA-ATL	16	63.22	59.94
-PAC	9	78.60	64.30

*62 seats			
LOCKHEED 049			
BNF	2	61.40	47.50
CAP	12	52.00	32.58
DAL	4	47.20	46.90
EAL	6	62.60	53.09
TWA	26	64.29	60.93

LOCKHEED 749/749A			
EAL	18	58.57	40.39
PNA	4	57.00	64.00
TWA	39	55.94	53.12

LOCKHEED 1049			
EAL	12	63.94	55.47
TWA	9	58.04	47.37
LOCKHEED 1049C			
EAL	16	77.60	45.64
LOCKHEED 1049G			
EAL	10	57.68	41.31
NWA	1	54.15	69.48
TWA	28	68.56	59.18
LOCKHEED 1049H			
EAL	1	66.48	49.76
NAL	4	60.00	56.00
TWA	2	60.30	62.40
LOCKHEED 1649A			
TWA	25	62.98	58.48
LOCKHEED LODESTAR			
NAL	9	54.00	40.00
MARTIN 2-0-2/4-0-4			
AAA	7	39.96	39.18
EAL	57*	55.21	49.85
PAL	7	56.40	...
TWA	48	61.88	57.54
*Martin 4-0-4			
VICKERS VISCOUNT			
CAP	59	61.06	50.37
HELICOPTER OPERATIONS			
BELL 47			
NYA	1	39.00	39.00
SIKORSKY S-51			
LAA	2	...	42.40
SIKORSKY S-55			
CHA	3	34.00	36.00
LAA	5	51.40	59.40
NYA	3	40.00	50.00
SIKORSKY S-58			
CHA	3	34.90	26.20
NYA	3	38.00	39.00

Airline operating costs

EDITOR'S NOTE: In past editions of this Air Transport Progress Issue, three-year comparative costs were listed by airline and type of equipment with the note of caution against general comparisons made invalid by variations in accounting practices, route operations, etc. With the addition of 1957 data, AMERICAN AVIATION urges against such comparisons due to marked changes in CAB's uniform system of accounts for which these statistics are compiled. Do not use these figures for comparison either between carriers or for the same carrier for 1957 and 1956.

AIRLINE OPERATING COSTS, influenced in 1957 by major changes in CAB reporting procedures for the first time, can only be analyzed in terms of general averages for types of equipment. And with the addition of certain indirect costs by CAB in revision of its system of accounting these figures no longer can be classed as direct operating costs.

Here's how carriers reported costs in cents per plane-mile for 1957:

Boeing 377—Four separate operations by three airlines showed an average cost of 155.03¢ per plane-mile.

Convair 240—In operations by four airlines, costs ranged from 67.00¢ to 113.96¢ with an average of 88.48¢ per plane-mile.

Convair 340/440—Eight airlines reporting on nine distinct operations averaged 100.34¢ per plane-mile with a low of 78.41¢ and high of 135.47¢.

C-46/CW20T—First tangible cost statistics on this aircraft in airline operation showed an average of 105.87¢ per

plane-mile for seven operations.

Douglas DC-3—With 27 airlines reporting, costs averaged 64.85¢ per plane-mile; range extended from 52.10¢ to 89.00¢.

Douglas DC-4—Twelve airlines having 19 specific DC-4 operations averaged 109.34¢ per plane-mile.

Douglas DC-6—Costs averaged 120.93¢ for seven airlines in 10 specific operations.

Douglas DC-6A—Five operations by four carriers showed an average 119.20¢ per plane-mile.

Douglas DC-6B—Twelve operations by eight airlines averaged 120.71¢.

Douglas DC-7—Average cost of 148.66¢ per plane-mile reflected seven operations of four airlines.

Douglas DC-7B—Three carriers in four distinct operations averaged 148.17¢ per plane-mile.

Douglas DC-7C—Five airlines, seven specific operations resulted in costs averaging 143.57¢.

(Continued on page 85)

This is **NORTH CENTRAL** America's leading local airline...

1st

IN PASSENGERS—more than a half million in 1957—680,930, an increase of 24 per cent over 1956. North Central leads the local airline industry in passenger traffic . . . schedules more plane-miles than any of the other local carriers.

• **THE NORTH CENTRAL** system now measures 3,240 unduplicated route miles—serving 53 cities in 9 states, a system three times larger than it was at the start, ten years ago.

1st

IN AIR MAIL, 1st IN AIR EXPRESS
North Central carries more Air Mail and Air Express than does any other local service airline.

• The Northliner fleet is the largest among local airlines—now 27 Douglas DC-3's. Since the start of operations, North Central has carried more than two million passengers some 320,000,000 passenger miles—and with a perfect safety record.

• North Central's personnel increase sharply reflects the airline's growth. Starting with less than 100 employees, it now has over 1000, including some 200 captains and co-pilots with slightly over 100 stewardesses.

NORTH CENTRAL AIRLINES

Route of the Northliners
serving

MINNESOTA • WISCONSIN • MICHIGAN
ILLINOIS • INDIANA • NORTH DAKOTA
SOUTH DAKOTA • IOWA • NEBRASKA



American serves you better when you fly



MERCURY SERVICE NEW YORK—LOS ANGELES

most frequent DC-7 nonstops—America's fastest airliner

radar-equipped • reserved seats
spacious lounge • superb cuisine
American's famous
stewardess service

 **AMERICAN
AIRLINES**
America's Leading Airline



AMERICAN AVIATION

(Continued from Page 83)

Lockheed 049—Averaged 174.07¢ for five carrier operations.

Lockheed 749/A—Five operations by three airlines brought average costs of 120.33¢.

Lockheed 1049—Three operations by two carriers averaged 115.83¢ per plane-mile.

Lockheed 1049C—One airline in two operations averaged 141.88¢.

Lockheed 1049G—Costs averaged 177.83¢ in six operations by three airlines.

Lockheed 1049H—Averaged 234.72¢ for four airlines having five distinct operations.

Lockheed 1649A—One carrier averaged 153.25¢ in two operations.

Lockheed Lodestar—Single operation reported cost of 66.72¢.

Martin 2-0-2/4-0-4—Four operations averaged 76.05¢ per plane-mile.

Viscount 745—Single operation showed costs of 84.90¢ per plane-mile.

HELICOPTERS

Sikorsky S-51—Cost 390¢ in one operation.

Sikorsky S-55—Two operators averaged 170.50¢.

Sikorsky S-58—One operation reported 331¢ per plane-mile.

Bell 47—Costs for single operation reported at 271¢.

OPERATING COSTS (Cents per plane-mile)

Airline	1957	1956	1955
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BOEING 377

EAL	135.47		
NWA	158.67	156.83	158.84
PAA-ALA	167.00F	168.61	
-PAC	159.00F	145.00	160.00

CONVAIR 240

AA	67.00	64.00	71.00
MOH	93.98	99.90	93.56
NEA	113.96	95.90	92.50
WAL	79.00	69.20	68.48

CONVAIR 340/440

BNF	78.41	70.55	74.99
CAL	88.00	72.90	71.50
DAL	83.79	71.94	77.00
EAL	135.47		
	109.81*		
HAL	92.00	87.47	98.14
NAL	103.25	45.82	78.88
UAL	112.00	84.77	83.33

*Convair 440

CURTIS C-46/CW20T

ASA	145.00		
ASA Int'l	62.20FC		
BNF	78.46C	65.63C	72.55C
DAL	107.20C		
NEA	183.27	97.60	
RID	89.00C		
	76.00FC		

DOUGLAS DC-3

AAA	57.10		
ASA	89.00		
BAL	62.35	46.62	46.43
BNF	52.10	42.75	44.07
CAL	62.00	48.30	47.14
CAP	58.00	45.70	45.40
CEN	63.10	53.96	50.03
CBA	79.10F	58.93	65.06

DAL	58.78	44.92	43.81
EAL	63.72	47.46	58.91
FAL	64.00	48.52	47.78
HAL	61.00	57.90	56.56
LCA	65.82	50.19	51.87
MAK	78.60F		
MOH	72.50	57.30	54.00
NEA	71.25	55.20	55.10
NOR	61.43	46.90	49.74
NWA	68.57	55.65	55.05
OZA	68.00	53.27	52.53
PAI	52.63	50.91	48.41
PAL	62.50	58.87	49.71
PNA	81.00F		
SOU	61.03	47.13	45.54
TPA	59.13	50.83	45.32
TTA	58.15		
WAL	60.00	48.90	41.63
WCA	60.00	48.74	50.22

DOUGLAS DC-4

AA	91.00C	110.00C	79.00
ASA	115.00		
CAP	110.10	74.10	68.70
EAL	106.36	96.48	70.72
	104.49F		
MAK	95.50F		
NWA	97.29	74.08	72.55
	106.11F	90.39F	89.44F
PAA-ALA	102.00F		
-LAT	97.00F	81.00F	76.00F
-PAC	117.00F	85.00F	104.00F
PNA	115.00F		
RAL	85.00C		
	104.00FC		
RID	232.00C		
	99.00FC		

(Continued on page 86)

VENDORS, AIRLINES, FBO's, PILOTS:

Where Were You When The Source Went Out?



DARK IS DANGEROUS IN SUPPLY EMERGENCIES

Whatever a man or a company needs, he's in the dark, figuratively speaking, if he has but one source of supply and something happens to knock it out of commission.

The sleepy gentleman here had prepared for just such an emergency: When the "fuse blew," he had a trusty candle within arm's reach by the bed—a second source of light-supply to see him through the night.

Now, as a distributor of America's finest aviation components and parts, Southwest Airmotive is not unlike the candle as a second source of supply. When an airline, a fixed base operator, or a fleet owner depends on the manufacturer as a single source, it can be entirely in the dark supply-wise in time of strike, disaster, or

shortage at the factory, or bottleneck along the way in transit. Southwest Airmotive provides vital emergency "insurance"—a second source, with items on the shelf ready for instant delivery whenever needed.

This second source guarantee is, we think, one of the most valuable services a distributor can perform; another reason for his existence and ever-increasing value to the industry.

Whether manufacturer or user, here's a question you should answer: Where will YOU be when the source goes out? For vital second-source facts, contact Marketing Manager, Distribution Division, Southwest Airmotive Co., Love Field, Dallas, Texas.

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DISTRIBUTION DIVISIONS: KANSAS CITY • DENVER

MOHAWK leads the short haul industry



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of its capacity with MODERN PRESSURIZED
Convair Flight Equipment!**

New Headquarters Plant Means Continued Progress

MOHAWK will move this summer into the finest, most modern local service airline headquarters building and maintenance plant in America—since developing MOHAWK's fleet to its proudest level, so it will render efficient service, is part of our pattern of leadership.

"The drive for profits is one of the basic motive forces in the system of free enterprise which has produced the material prosperity and freedom we know in this country today."

Louis J. Hector, Member - CAB

MOHAWK Order E-12139, January 24, 1958
Concurring in the favorable Majority Decision



MOHAWK AIRLINES

The Route of the Air Chiefs
EXECUTIVE OFFICES: UTICA, NEW YORK

Airline	1957	1956	1955
TWA	87.23 87.23C 136.11FC	90.28	74.80
DOUGLAS DC-6			
AA	86.00 81.00F	80.00 80.00F	84.00 89.00F
BNF	110.88 113.81F	86.98 99.35F	92.13 98.61F
DAL	97.79	90.09	119.10
NAL	128.80	98.48	109.73
PAA-LAD	200.00F	138.00F	127.00F
RID	133.00C 147.00FC		
UAL	111.00	82.19	84.41
DOUGLAS DC-6A			
AA	109.00C 117.00FC	108.00C 118.99FC	103.00C 136.00FC
CAL	134.00	123.00	139.65
PAA-LAD	125.00F	105.00F	94.00F
UAL	111.00C	114.05	
DOUGLAS DC-6B			
AA	104.00 97.00F	102.00 103.00F	
EAL	135.46		
NAL	132.48	108.04	110.79
NEA	106.79		
NWA	127.80	121.04	116.19
PAA-LAD	132.64F 157.00F	121.57F 129.00F	127.13F 112.00F
UAL	124.00 118.00F	97.69 93.21	97.44
WAL	107.00 106.00F	98.10	96.25
DOUGLAS DC-7			
AA	130.00 161.00F	123.00	125.00
DAL	150.96 150.88F	128.07 134.99F	123.39 137.11F
NAL*	179.78	137.70	135.73
UAL	134.00 141.00F	114.58 122.75F	111.49 119.89F
*Includes DC-7B			
DOUGLAS DC-7B			
CAL	127.00		
EAL	159.18 159.89F		
PAA-LAD	147.61	194.00	
DOUGLAS DC-7C			
BNF	125.80 137.77F		
EAL	135.45	154.48	165.77
NWA	129.68 144.34F		
PAA-ALA -PAC	179.00F 153.00F		
LOCKHEED 049			
BNF	174.29	144.01	124.10
CAP	157.30	121.10	
DAL	228.76	177.70	
EAL	215.84		
TWA	97.88	101.10	93.62
LOCKHEED 749/749A			
EAL	106.36 97.48F	94.60	94.99
PNA	153.00F		
TWA	105.24 137.60F	109.32 134.39F	101.95 133.42F
LOCKHEED 1049			
EAL	113.49 106.38F	96.95	135.44
TWA	127.63	133.70	136.90
LOCKHEED 1049C			
EAL	147.20 140.35F	154.64 146.36F	145.52
LOCKHEED 1049G			
EAL	164.03 166.54F	273.48	

AMERICAN AVIATION

Airline	1957	1956	1955
NWA	210.83	177.48	175.78
	205.56F	182.44F	
TWA	139.78	143.69	136.90
	180.26F	177.48F	229.10F
	LOCKHEED 1049H		
EAL	272.63		
NAL	105.59		
RAL	206.00F		
TWA	379.20		
	210.20FC		
	LOCKHEED 1649A		
TWA	138.95		
	167.56F		
	LOCKHEED LODESTAR		
NAL	66.72		
	MARTIN 202/404		
AAA	84.87		
EAL	71.90		
PAL	62.08	81.69	83.24
TWA	85.38		
	VICKERS VISCOUNT		
CAP	84.9		
	HELICOPTER OPERATIONS		
	SIKORSKY S-51		
LAA	390.00		
	SIKORSKY S-55		
LAA	126.00		
NYA	215.00		
	SIKORSKY S-58		
NYA	331.00		
	BELL 47		
NYA	271.00		
C-Cargo F-International FC-Int'l Cargo			

Maintenance costs

Airline maintenance costs per flight hour, expressed here in dollars, are influenced heavily by such factors as fleet size, overhaul periods, etc. As a result, they vary widely among airlines and should not be directly compared.

As in the case of operating costs, major alterations in CAB reporting procedures for these statistics makes it mandatory that they not be used for such comparison, even for the same carrier between 1957 and 1956.

However, to provide continuity of maintenance cost statistics, the editors will continue to tabulate three-year figures for reference only.

Here's how airlines reported these costs in a survey conducted by AMERICAN AVIATION:

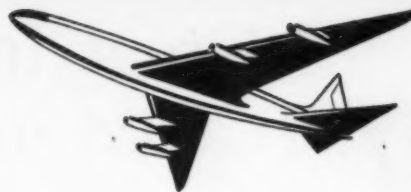
(Dollars per flight hour)

Airline	1957	1956	1955
	BOEING 377		
PA-ALA	N/A		
ATL	\$ 80.28	\$111.51	
PAC	N/A	85.45	\$92.81
NWA	174.22	98.98	96.13
	CONVAIR 240		
AA	\$ 32.61	\$ 42.90	\$ 41.02
NEA	96.58	53.48	52.90
MOH	38.26	60.20	61.27
	CONVAIR 340/440		
BNF	\$ 32.60	\$ 36.77	\$ 39.06

(Continued on page 89)

Scott

AVIATION



the foremost supplier of

Jet Airliner OXYGEN EQUIPMENT

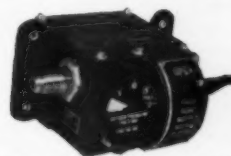
Scott anticipated the Jet Airliner oxygen problems and designed entirely new concepts, years before they were required.

Being "first with the most" has won Scott oxygen equipment the position of being specified original equipment on most of the world's jet airliners.



Emergency Passenger Oxygen System. Masks automatically presented to passengers. Flow of oxygen to mask starts when passenger pulls mask to face.

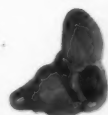
Scotteramic Mask with vision unlimited. Provides respiratory and visual protection to crew during smoke and fume emergencies.



10500 Automatic Turn-On Valve. Activates emergency passenger oxygen system in event of cabin pressure loss.



Model 5600 Portable Dual-Purpose Oxygen Unit. Provides demand and constant flow oxygen. Serves passengers and crew for supplemental, therapeutic, or smoke protection use.



5120 Universal Oxygen Outlet. Accommodates most oxygen mask plug-ins.



10260 Pressure Reducing Regulator. Reduces cylinder pressure to system working line pressures. Highest capacity regulator produced today, yet smallest and lightest in weight.



10400 Diluter-Demand Miniature Panel Regulator. Supplies all crew oxygen requirements for jet transport operation.



11200-4 Slow-Opening Cylinder Valve. Offers extra safety protection against high pressure surges when cylinder valves are open.



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the medium range needs of the expanding new era of air travel.

The Caravelle is also the quietest of *all* aircraft . . . with passenger comfort that cannot be surpassed. It is practical. Economical. And available.



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SUD AVIATION

37 Boulevard De Montmorency — Paris (16) — Sud Aviation Corp., 500 Fifth Avenue, New York 36, N. Y., U.S.A.

Airline	1957	1956	1955
CAL	60.90	36.76	36.29
DAL	50.61	34.44	40.08
EAL	33.60*		
	33.03		
HAL	40.73	37.90	35.45
NAL	63.34	37.24	37.08
UAL	75.71	39.12	38.86
WAL	39.91	45.42	39.06

*Convair 440 only.

CURTISS C-46/CW20T

ASA	\$ 60.27		
ASA INT'L	124.26		
BNF	36.10	\$ 31.37	
DAL	79.91		
NEA	167.93	29.69	
RID	47.51		

DOUGLAS DC-3

AAA	\$ 19.11		
ASA	47.81		
BAL	32.07	\$ 16.77	\$ 15.77
BNF	18.24	16.32	16.90
CAL	28.07	15.49	16.73
CAP	28.37	16.43	14.65
CBA	50.04	29.26	31.00
CEN	91.31	18.66	17.96
DAL	32.80	17.98	15.09
EAL	20.00	19.29	27.79
FAL	33.44	15.87	
HAL	22.99	22.77	24.78
LCA	23.00	18.19	19.45
MAK	31.12		
MOH	23.26	20.50	18.44
NEA	39.05	19.20	20.40
NOR	29.85	18.07	19.08
NWA	34.47	23.00	18.49
OZA	18.8	21.31	20.09
PAI	17.93	19.04	17.58
PAL	N/A		17.48
PANAGRA	N/A		
PNA	42.46		
SOU	32.29	16.05	15.92
TPA	33.98	16.56	16.12
TTA	25.41	18.83	17.47
WAL	17.80	21.51	14.16
WCA	22.20	13.30	13.55

DOUGLAS DC-4

AA	\$ 53.87	\$101.36	\$ 66.91
ASA	57.71		
CAP	72.41	42.49	47.22
EAL	49.56	55.07	47.22
MAK	61.98		
NWA	74.22	41.97	40.53
PAA-ALA	N/A		
-ATL	33.86	48.33	52.17
-LAD	66.95	54.69	
-PAC	N/A	44.20	51.21
PANAGRA	N/A		
PNA	90.53		
RAL	67.75		
RID	63.14		
TWA	54.81	60.54	46.16

DOUGLAS DC-6

AA	\$ 45.93	\$ 62.84	\$ 50.60
BNF	64.84	57.70	64.31
NAL	112.85	51.45	
PAA-AD	123.83	82.59	
RID	91.96		
UAL	125.05	55.04	54.02

DOUGLAS DC-6A

AA	\$ 43.98	\$ 44.42	
DAL	91.33	66.70	\$ 83.23
PAA-AD	89.26	56.21	
UAL	112.89	60.48	

DOUGLAS DC-6B

AA	\$ 41.09	\$ 62.18	
CAL	82.45		
EAL	33.03		
NAL	102.29		
NEA	56.87		

(Continued on page 91)

High Accuracy Mach Information in the

DC 8



GIANNINI MODEL 451212 PRESSURE TRANSDUCER



Fast, accurate Mach information is supplied from two Giannini Model 451212 Pressure Transducers for control purposes in the new Douglas DC-8 jet-liner. This is critically important information for a passenger transport that will operate in the transonic range at 40,000 feet.

The high resistive output of the transducers, which are accurate to within 1% of reading, eliminates the need for a computing servo... greatly simplifying the instrumentation.

SPECIFICATIONS

RESOLUTION: to 2000 wires (0.05%)

ACCURACY: Within 1% of reading

RANGE: 0-10 to 0-50 psi (absolute, differential, or gage)

ENVIRONMENTAL: Meets appropriate MIL-SPECS.

Giannini measures & controls:

ω	β	θ	ψ	τ	v	ϕ
b	Ω_r	a	h	P	ΔP	T
T_0	P_0	Q_c	M	T_0	P_r	TAS

PRECISION
INSTRUMENTS
AND CONTROLS

Giannini

G. M. GIANNINI & CO., INC., 910 EAST GREEN STREET, PASADENA, CALIF.



WHAT IS "TOTAL ELECTRONICS"?

The picture suggests the answer.

In the new world of missiles and space systems to come, it's the *total* complex of control, guidance and communication—the whole interrelated nervous system correlating the eye, the hand, the head and the heart of the missile to that of man himself.

And in the company producing that missile, it's the *total electronics capability* necessary to specify, design, create and test this central nervous system as an integral part of the whole machine—from its conception, through delivery to the customer, to the final completion of its mission.

In the period of a dozen years since the word "electronics" first gained common currency in our industry, Martin has been systematically building toward just such a total electronics capability.

As a result of the rapid evolution in advanced electronics development, today one-third of all Martin engineering manpower is devoted to the electronics requirements of our customers' present and future products. And a major part of Martin's investment is in the special facilities necessary to this new concept of total electronics.

We believe that this capability is essential to our increasingly important function as a prime contractor to all branches of the military.

MARTIN
BALTIMORE • DENVER • ORLANDO



Airline	1957	1956	1955
NWA	82.72	52.01	\$46.37
PAA-ATL	48.92	68.38	56.29
-LAD	113.69	75.73	
-PAC	N/A	68.65	52.04
PANAGRA	N/A		
UAL	100.68	53.99	52.26
WAL	47.59	43.64	43.18

DOUGLAS DC-7

AA	\$ 55.93	\$ 94.63	\$105.60
EAL	21.35		
DAL	148.22	109.26	85.97
NAL*	185.79	103.13	113.30
UAL	132.44	80.38	77.66

*Includes DC-7B.

DOUGLAS DC-7B

CAL	\$119.74		
EAL	85.56	83.85	
PAA-LAD	147.61	32.16	
PANAGRA	N/A		

DOUGLAS DC-7C

BNF	\$ 76.10	\$ 27.53	
EAL	33.03		
NWA	82.43		
PAA-ATL	69.68	60.30	
-PAC	N/A	63.05	

LOCKHEED 049

BNF	\$102.31	\$102.63	\$ 52.78
CAP	119.38		
DAL	147.02	114.55	
TWA	68.58	87.79	68.72

LOCKHEED 749/749A

EAL	\$ 73.14	\$ 72.38	\$ 78.16
PNA	127.28		
TWA	61.95	70.94	56.93

LOCKHEED 1049

EAL	\$ 81.66	\$ 77.24	\$ 72.01
TWA	75.90	98.53	79.94

LOCKHEED 1049C

EAL	\$ 81.64	\$ 99.01	\$ 78.14
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LOCKHEED 1049G

EAL	\$ 68.56	\$ 65.03	
NWA	167.55	87.45	71.10
TWA	92.50	107.90	61.60

LOCKHEED 1049H

EAL	\$382.52		
NAL	25.48		
RAL	162.15		
TWA	100.44		

LOCKHEED 1649A

TWA	\$ 59.48		
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LOCKHEED LODESTAR

NAL	\$ 45.78		
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VICKERS VISCOUNT

CAP	\$ 57.09	\$ 34.55	
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MARTIN 202/404

AAA	\$ 33.82		
EAL	38.50*		42.51
PAL	N/A		42.51
TWA	36.31	49.99	38.46

*Martin 404

HELICOPTER OPERATIONS

BELL 47

CHA	N/A	\$ 15.25	
NYA	\$30.24	28.50	

SIKORSKY S-51

LAA	\$ 47.22	\$23.62	
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SIKORSKY S-55

CHA	N/A	\$ 15.85	
LAA	\$30.92		
NYA	47.72	41.54	

SIKORSKY S-58

CHA	N/A		
NYA	\$55.25	\$24.75	

Air transport speeds

A good index of the mounting problem facing all segments of aviation as air traffic increases is the toll this congestion takes of aircraft speed. A 365-mph Douglas DC-7, worked in to the routes of various airlines in the U.S., is fortunate if it betters 300-mph when such factors as lower climb speeds, short-stage routings, etc. are taken into account.

However, from year to year these operational factors tend to balance each other out and an aircraft should average about the same speed from one year to the next. This has not been the case with U.S. scheduled airlines, and the explanation can only stem from one cause common to all carriers—increased ATC delays.

Individual speeds averaged by all carriers by type of equipment are shown in these statistics compiled from an AMERICAN AVIATION survey:

Airline	Revenue Flight Hours	Revenue Miles	Average Speed
BOEING 377			
NWA	27,271	6,759,079	248
PAA-ALA	7,234	1,805,119	250
PAA-ATL	24,303	6,072,125	250
PAA-PAC	54,565	14,020,941	256
CONVAIR 240			
AA	183,507	35,078,370	191

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agency or write to
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Hancock 6-4425 Franklin 9-8331
CHICAGO
Dearborn 2-4432

MOH	14,579	2,659,263	184
NEA	12,856	2,407,120	187
WAL	27,122	5,423,388	199

CONVAIR 340/440

BNF	85,455	17,736,660	204
CAL	26,892	5,538,916	203
DAL	76,985	15,709,419	202
EAL	35,782	6,782,207	190
HAL	8,071	1,546,576	191
NAL	42,805	8,240,062	193
UAL	118,273	22,777,953	192

CURTIS C-46/CW20T

Alaska	2,504	425,634	178
ASA Int'l	9,491	1,936,557	210
BNF	1,796	339,457	189
DAL	1,861	336,812	181
NEA	911	168,320	185
Riddle	31,616	5,677,872	179

DOUGLAS DC-3

Alaska	2,752	411,618	149
AAA	35,272	4,713,082	133
BAL	21,311	3,165,254	148
BNF	40,499	6,301,032	156
CAL	35,329	5,347,582	151
CAP	41,299	5,578,873	135
CBA	7,636	1,065,833	140
CEN	23,275	3,367,835	143
DAL	33,823	4,953,674	146
EAL	7,426	1,018,528	135
FAL	37,914	5,583,686	147
HAL	9,868	1,478,954	150
LCA	20,218	2,781,004	137
Mackey	2,755	384,535	139
MOH	19,897	2,652,126	134
NEA	28,248	3,901,347	138
NOR	67,983	9,494,900	140
NWA	13,671	1,910,659	139
OZA	43,682	6,173,685	141
Pacific	4,460	625,037	140
PAI	51,133	7,424,438	145
PNA	4,897	698,673	143
Panagra	3,149	504,833	160
SOU	26,723	3,901,046	146
TPA	11,964	1,777,107	148
TTA	41,474	6,271,605	152
WAL	9,221	1,394,284	151
WCA	30,047	4,030,658	161

DOUGLAS DC-4

Alaska	8,583	1,670,866	195
AA	2,139	385,619	180
CAP	29,999	4,874,324	163
EAL	23,823	4,524,822	190
Mackey	2,476	483,103	195
NWA	48,375	9,043,425	187
PAA-ALA	2,296	458,300	200
PAA-ATL	24,098	4,515,195	188
PAA-LAD	31,284	6,503,606	207
PAA-PAC	4,468	869,402	194
Panagra	1,933	383,289	200
PNA	3,077	602,507	196
Resort	34,670	6,552,520	189
Riddle	2,995	596,470	199
TWA	14,691	2,772,645	188
WAL	1,946	340,543	175

DOUGLAS DC-6

AA	155,958	38,511,704	247
BNF	15,192	3,762,229	248
DAL	31,018	7,717,623	248
NAL	11,930	2,938,444	246
Riddle	1,407	352,691	250
UAL	135,166	34,316,655	254

DOUGLAS DC-6A

AA	20,936	5,259,232	250
PAA-ATL	3,253	808,138	248
PAA-LAD	7,484	1,962,945	262
UAL	12,003	3,059,546	254

DOUGLAS DC-6B

AA	79,008	19,617,518	249
CAL	4,056	1,017,825	250
NAL	31,318	7,599,068	242
NEA	17,204	4,300,077	250
NWA	45,379	11,532,874	254
PAA-ATL	48,655	12,056,351	248

PAA-LAD	67,906	17,249,594	253
PAA-PAC	9,804	2,394,212	244
Panagra	7,676	1,959,889	255
UAL	106,113	27,356,716	257
WAL	60,222	14,738,237	244

DOUGLAS DC-7

AA	146,405	44,236,646	302
DAL	43,783	12,547,131	286
EAL	894	247,085	276
NAL	15,011	4,180,019	278
UAL	135,714	41,395,537	305

DOUGLAS DC-7B

CAL	7,509	2,210,080	293
EAL	74,102	20,604,903	278
PAA-LAD	23,114	6,746,897	292
Panagra	9,149	2,695,238	296

DOUGLAS DC-7C

BNF	17,157	4,961,670	290
EAL	484	133,554	276
NWA	13,673	4,002,691	292
PAA-ALA	53	14,178	267
ATL	58,298	16,215,122	278
PAC	27,530	8,042,784	292

LOCKHEED 049

BNF	3,961	896,630	226
DAL	7,299	1,592,506	218
EAL	9,935	2,208,579	222
NAL*	3,937	886,426	225
TWA	103,061	23,891,984	232

*Interchange equipment.

LOCKHEED 749/749A

CAP	22,695	4,751,953	209
EAL	55,796	12,640,608	226
PNA	10,198	2,568,448	252
TWA	109,749	26,227,726	250

LOCKHEED 1049

EAL	52,481	13,033,342	249
TWA	27,087	7,023,351	260

LOCKHEED 1049C

EAL	65,508	16,415,588	250
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LOCKHEED 1049G

EAL	38,325	9,664,179	252
NWA*	5,371	1,435,087	267
TWA	100,627	27,152,059	270

*Sold in July.

LOCKHEED 1049H

EAL	9,737	2,494,168	256
NAL	2,099	553,957	265
TWA	247	65,256	264

LOCKHEED 1649A

TWA	38,843	11,130,880	287
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LOCKHEED LODESTAR

NAL	5,576	863,880	155
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MARTIN 202/404

AAA	9,960	1,676,137	168
EAL	181,931	32,841,749	180
Pacific	3,419	620,819	181
TWA	108,480	19,959,272	184

VICKERS VISCOUNT

CAP	175,150	43,404,490	248
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HELICOPTER OPERATIONS

BELL 47

CHA	4,492	242,479	54
NYA	155	9,428	61

SIKORSKY S-51

LAA	100	5,881	59
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SIKORSKY S-55

CHA	3,162	215,143	68
LAA	8,148	566,833	69
NYA	4,575	232,995	51

SIKORSKY S-58

CHA	1,395	111,042	79
NYA	3,566	236,549	66

Avgas/oil bills top \$300 million

U.S. airlines, including domestic, international, local service and other scheduled carrier groups spent some \$294,506,262 for avgas and \$7,873,593 for engine oil in 1957.

The total of \$302,379,855 represents a \$40.9 million jump over the previous year or better than a 15% increase.

Avgas purchases showed a rise from 1.38 billion gallons in 1956 to 1.61 in '57 and oil gallonage increased from 17.8 to 19.5 millions.

In 1957, for the first time, CAB reporting procedures disclosed a dollar breakdown of gas and oil spending, thereby permitting an average cost-per-gallon to be determined for individual airlines.

For example, according to CAB figures, American spent an average of 18.8¢ per gallon for avgas in domestic operations and 18.4¢ in international. Eastern averaged 18.2¢ domestically, but spent 20.2¢ in international service.

The airline industry as a whole averaged 18.4¢ per gallon for the 1.6 billion purchased. Capital Airlines, only major turboprop operator, recorded an average of only 12.6¢ per gallon—a figure explained by its widescale use of kerosene.

The following tabulations show spending by individual airlines in 1957:

Carrier	Domestic		Total Cost	
	Fuel (Gallons)	Oil (Gallons)	Fuel	Oil
American	229,548,480	3,121,294	\$ 43,100,016	\$ 1,157,790
Brasiff	42,243,245	517,205	7,616,207	167,482
Capital	103,807,853	393,733	13,181,657	372,110
Continental	17,439,820	207,101	3,286,228	74,818
Delta	61,853,161	836,887	11,387,440	287,549
Eastern	213,518,349	2,778,467	38,897,519	1,058,770
National	38,034,396	430,006	5,925,356	135,262
Northeast	13,324,910	140,413	925,831	27,593
Northwest	46,731,465	542,158	8,922,463	200,311
TWA	177,627,808	2,292,361	31,687,692	782,802
United	201,776,310	2,803,528	37,839,933	976,524
Western	32,439,232	310,053	5,961,214	149,109
TOTALS	1,180,545,029	14,372,206	\$208,731,556	\$ 5,392,000

Carrier	International		Total Cost	
	Fuel (Gallons)	Oil (Gallons)	Fuel	Oil
American	4,443,793	62,229	\$ 851,752	\$ 22,502
Brasiff	5,396,048	57,936	1,352,135	44,823
Delta	3,951,158	61,868	854,175	40,302
Eastern	16,219,842	209,708	3,301,339	83,385
National	2,409,972	25,587	390,244	9,233
Northwest	14,361,755	176,676	106,208	19,644
Panagra	9,653,781	130,805	2,836,377	87,249
Pan American				
Alaska	5,232,778	64,680	1,268,963	30,754
Atlantic	76,900,335	900,941	19,058,778	570,327
Latin America	61,834,642	647,187	13,011,204	305,960
Pacific	53,417,644	641,614	11,895,271	361,300
TWA	40,940,752	487,112	9,826,062	288,718
United	2,078,073	29,621	1,732,089	49,015
Western	391,154	4,437	194,389	4,348
TOTALS	297,311,747	3,502,600	\$ 66,677,986	\$ 1,917,588

Carrier	Territorial and Alaskan		Total Cost	
	Fuel (Gallons)	Oil (Gallons)	Fuel	Oil
ALASKA	3,003,538	36,561	N.A.	N.A.
Alaska Coastal	513,758	7,223		\$ 142,778
Caribair	769,202	7,889		41,362
Cordova	769,857	13,896	N.A.	N.A.
Ellis	306,380	3,630	N.A.	N.A.
Hawaiian	2,754,941	39,985	549,679	23,122
Nor. Consol.	741,571	7,930		
Pacific Nor.	5,796,444	70,462	1,274,158	34,070
Reeve	547,742	6,199	N.A.	N.A.
Trans Pacific	1,225,892	15,158	9,027	346
Wien	1,628,034	18,744		604,869
TOTALS	18,057,361	227,677	\$ 1,832,864	\$1,114,502 \$59,538

Carrier	Local service		Total Cost	
	Fuel (Gallons)	Oil (Gallons)	Fuel	Oil
Allegheny	5,751,877	83,121	\$ 1,075,473	\$ 42,954
Bonanza	2,300,655	29,100	480,532	13,973
Central	2,505,381	44,114	441,574	28,625
Frontier	4,153,645	47,131	799,356	21,485
Lake Central	2,144,843	32,689	413,753	20,259

(Continued on following page)



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SCANDINAVIAN SOUTHWEST
TWA UNITED WESTERN



(Continued from page 93)

Carrier	Fuel (Gallons)	Oil (Gallons)	Total Cost	Oil
Mohawk	5,792,536	81,821	N.A.	N.A.
North Central	4,923,757	54,831	\$1,276,105	\$25,703
Ozark	4,378,651	47,291	799,908	23,290
Piedmont	5,413,692	66,110	1,006,178	28,589
Southern	2,793,478	34,152	N.A.	N.A.
Trans Texas	4,539,728	74,607	783,236	32,526
West Coast	3,069,911	28,699	577,658	15,623
TOTALS	49,789,274	623,666	7,603,773	248,029

All-cargo

Carrier	Fuel	Oil	Total Cost	Oil
AAXICO	N.A.	N.A.	171,423	13,903
Aerovias	1,763,381	15,528	508,924	13,903
Flying				
Tiger	24,812,649	295,907	5,969,801	242,535
Mackey	878,705	9,159	202,114	N.A.
Slick	15,126,100	177,354	N.A.	N.A.
S & W	12,815,715	182,905	N.A.	N.A.

Resort	7,779,807	79,746	1,585,392	
TOTALS	63,176,357	760,599	6,478,725	1,787,506

Helicopters

CHI Helicopter	410,204	4,667	77,733	
Los Angeles	368,904	7,218	70,485	
New York Airways	608,464	10,902	131,132	
TOTALS	1,387,572	22,787	279,350	



John F. Peterson

Director of Maintenance
Trans Caribbean Airways, Inc.

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John demands maximum reliability and safety from all equipment. That's why he specifies Airwork overhauled R-2800 CB-17 engines ... the finest R-2800 engines available today.



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Engine overhaul

Engine TSO, airline maintenance language for time since overhaul, is restricted by a CAA time limit and that limit plays a key role in airline operating costs.

A 100-hour time increase on a 1,000-hr. engine represents a 10% increase. If an airline overhauls 10 engines a week based on the former period, the time jump reduces the frequency of return for overhaul, hence reduces overhaul costs.

During 1957, the "twilight" period of piston engine service improvement, airlines showed some remarkable gains in bringing engine times up to the 2,000-hour level.

For the first time in airline history a Pratt & Whitney-built engine (R2800-CB16) was approved for 2,000-hour operation by United Air Lines and an adaptation of its World War II R2800-83 modernized by American Airlines reached 2,030 hrs.

Until last year, only Wright-built engines, R3350-BD models had achieved 2,000-hour overhauls in operation by Chicago & Southern (Delta), Eastern and TWA.

Capital Airlines, only U.S. turbo-prop carrier, showed a 200-hour gain in overhaul time for its Rolls-Royce Dart moving its time limit from 1,400 to 1,600 hrs.

Here's how all airlines reported engine times for various models at the year end:

Airline	Model	Time (Hrs.)
FRANKLIN 335		
CHA	-C32AB	
NYA	-C32	600
P & W R985		
ELS	-AN6	1,200
LAA	-B4	1,100
Wien	-ANI	1,000
P & W R1340		
CHA	-S3H2, -40	700
LAA	-40, -49MI	800
Wien	-ANI	800
P & W R1830		
AAA	-92	1,200
	-85	1,300
BAL	-92, -65	1,200
BNF	-S3C4G, -S1C3G	1,250
CAL	-92, -900	1,300
CAP	-G200	1,600
CBA	-S4C4G	1,050
CEN	-90D, -92	1,200
FAL	-92	1,000
HAL	-S1C3G, -92	1,400
LCA	-90D	1,200
NEA	-92	1,300
NWA	-S1C3G	1,200
OZA	-92	1,200
PAI	-92	1,300
PAL	-92	1,200
PNA	-90D	1,200
SOU	-90D	1,300
TPA	-92	1,400
TTA	-92	1,300
WAL	-92	1,300
WCA	-90D	1,450
Wien	-90D	1,100

Airline

Model Time (Hrs.)

P & W R2000

AA	-13G	1,430
CAP	-13G	1,600
HAL	-CB3	1,500
MAK	7M2	1,200
NWA	-13	1,700
PAA-PAC/ALA	-D5	1,900
PNA	-D5, -7M2	1,600
RAL	-7M2, -D5, -9M4	1,600
RID	7M2	1,250
TWA	-9	1,600

P & W R2800

AA	-83AM4A	1,730
	-83AM7	2,030
	-CB16/17	1,930
ASA Int'l	-M1	1,200
BNF	-AM4	1,000
	-CB16	1,500
	-A55	1,600
CAL	-CB16	1,500
DAL	-CB16/17	1,700
	-57	1,000
EAL	-CB3, -CB16	1,700
	-CB17	1,820
	-D5	1,900
HAL	-CB17	1,700
MOH	-CA3	1,200
	-CA18	1,200
NAL	-CB16/17	1,600
NEA	-CB3, -CB16	1,600
NWA	-CB17	1,800
PAA-ATL	-CB16/17	1,800
PAL	-CA18	1,200
RID	-M1, -34	1,350
TWA	-CB16	1,700
UAL	-CB16*	1,400
	-CB16**	2,000
	-CB16***	1,700
	-CB17	1,400
WAL	-CB16	1,700
Wien	-75	1,000

*Convair 340

**DC-6

***DC-6B

P & W R4360

NWA	-CB2, -B6	1,300
PAA-ATL	-B6	1,500
-PAC/ALA	-B6	1,600

R R TURBOPROP

CAP	-DART 506, 510	1,600
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WRIGHT R1820

CHA	-HE2	
DAL	-G202A	1,600
MAK	-G202A	1,200
MOH	-G202A	1,400
NAL	-G202A	1,450
NOR	-G202A	1,300
NYA	-HE2	600

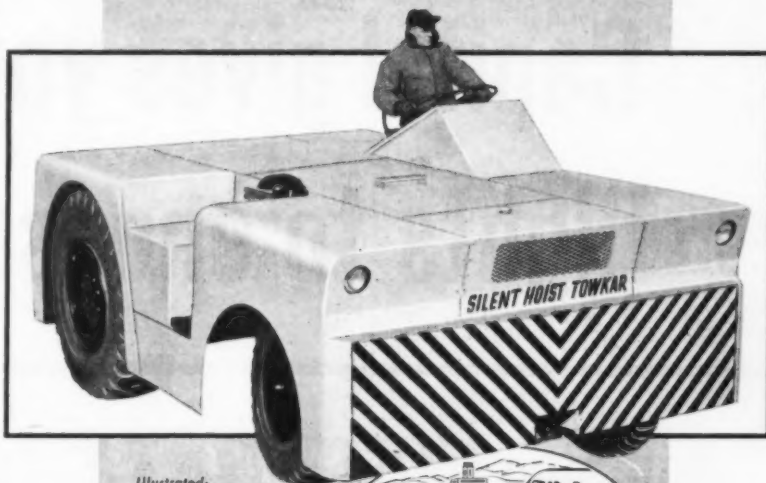
WRIGHT R3350

BNF	-BA3	1,000
CAP	-BA3	1,400
DAL	-BA3	1,200
EAL	-BD1	2,125
	-CB1	1,600
PNA	-BD1	2,000
TWA	-CB1, -BA3	1,500
	-BD1	2,100

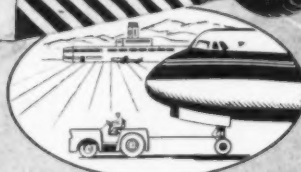
WRIGHT TURBO COMPOUND

AA	-DA2/4	1,230
BNF	-EA1	1,200
CAL	-DA4	1,100
DAL	-DA2/4	1,200
EAL	-DA1, -EA3, -EA1, -EA4	1,300
	-DA1, -EA1	1,200
	-DA4	1,400
NWA	-EA14	1,200
PAA-PAC/ALA	-EA1	1,200
TWA	-EA3	1,000
	-EA2	1,100
	-DA3	1,200
UAL	-DA2, -DA4	1,200

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AIRLINES OF THE WORLD

NORTH AMERICA

UNITED STATES

AAXICO Airlines, Inc. Int'l Airport, P.O. Box 875, Miami 48, Fla. Equipment: 40 C-46s. On order: 1 DC-6A.

Aerovias Sud Americana, Inc. (ASA International Airlines). Pinellas Int'l Airport, St. Petersburg, Fla. Equipment: 6 C-46s.

Alaska Airlines, Inc. General Offices: 2320 Sixth Ave., Seattle 1, Wash. Equipment: 1 DC-6A; 3 C-46s; 3 DC-4s; 1 DC-3; 2 Lockheed L-749As; single-engine ski & float equipment.

Alaska Coastal Airlines. 2 Marine Way, Juneau, Alaska. Equipment: 2 PBys; 9 Grumman G-21As; 1 Lockheed Vega; 1 Bellanca; 2 Piper Pacers; 1 Cessna 195; 1 Cessna 180; 1 Hiller H-12C Helicopter.

Allegheny Airlines, Inc. Washington National Airport, Hangar No. 12, Washington 1, D. C. Equipment: 15 DC-3s (3 leased); 7 Martin 2-0-2s.

American Airlines, Inc. 100 Park Ave., New York 17, N.Y. Equipment: 58 DC-7s; 25 DC-6Bs; 50 DC-6s; 10 DC-6As; 59 Convair 240s. On order: 30 Boeing 707s; 35 Lockheed Electras.

Bonanza Air Lines, Inc. P.O. Box 391, McCarran Field, Las Vegas, Nev. Equipment: 10 DC-3s. On order: 6 Fairchild F-27s.

Braniff Airways, Inc. Braniff Airways Bldg., Exchange Park, Dallas 35, Tex. Equipment: 23 DC-3s; 7 DC-7Cs; 9 DC-6s; 25 Convair 340s; 6 Convair 440s; 2 Lockheed 049s; 2 C-46s. On order: 5 Boeing 707s; 9 Lockheed Electras.

Capital Airlines, Inc. Washington National Airport, Washington 1, D.C. Equipment: 20 DC-3s; 14 DC-4s; 12 Lockheed 049s; 59 Viscounts. On order: 9 Convair 880s.

Caribbean-Atlantic Airlines, Inc. P.O. Box 6035, Loiza Station, Santurce, Puerto Rico. Equipment: 5 DC-3s.

Central Airlines, Inc. Meacham Field, Fort Worth, Tex. Equipment: 13 DC-3s.

Chicago Helicopter Airways, Inc. 5240 W. 63rd St., Chicago 38, Ill. Equipment: 3 Bell 47Gs; 3 S-55s; 3 S-58s. On order: 2 S-58s.

Continental Air Lines, Inc. Stapleton Airport, P.O. Box 9063, Denver 16, Colo. Equipment: 13 DC-3s; 6 Convair 340s; 5 DC-6Bs; 3 Convair 440s; 4 DC-7Bs. On order: 1 DC-7B; 15 Viscount 810Ds; 4 Boeing 707s.

Cordova Airlines. P.O. Box 1499, Anchorage, Alaska. Equipment: 2 DC-3s; 1 C-46; 2 Cessna 180s; 3 Cessna 170s; 2 Grumman G-44s; 2 Super Cubs.

Delta Air Lines, Inc. Atlanta Airport, Atlanta, Ga. Equipment: 21 DC-7s; 7 DC-6s; 20 Convair 340s; 8 Convair 440s; 4 Lockheed 049s; 15 DC-3s; 5 C-46s. On order: 6 DC-7Bs; 8 DC-8s; 10 Convair 880s.

Eastern Air Lines, Inc. Eastern Air Lines Bldg., 10 Rockefeller Plaza, New York 20, N.Y. Equipment: 16 Lockheed 1049Cs; 12 Lockheed 1049s; 18 Lockheed 749s; 57 Martin 4-0-4s; 1 DC-4; 31 DC-7Bs; 20 Convair 440s; 10 Lockheed 1049Gs. On order: 20 DC-8s; 18 DC-7Bs; 40 Lockheed Electras.

Elis Air Lines. Box 1059, Ketchikan, Alaska. Equipment: 2 Cessna 180s; 9 Grumman G-21As.

The Flying Tiger Line, Inc. Lockheed Air

Terminal, Burbank, Calif. Equipment: 11 C-46s; 10 Lockheed 1049Hs. Leased—2 DC-6As; 2 Lockheed 1049Hs.

Frontier Airlines, Inc. Stapleton Airfield, Denver 7, Colo. Equipment: 16 DC-3s.

Hawaiian Airlines Ltd. Honolulu Int'l Airport, Honolulu 17, T. H. Equipment: 8 DC-3s; 5 Convair 340s; 1 DC-6.

Lake Central Airlines, Inc. Weir Cook Municipal Airport, Indianapolis 44, Ind. Equipment: 10 DC-3s.

Los Angeles Airways, Inc. 5901 W. Imperial Highway, Los Angeles 45, Calif. Equipment: 2 S-51s; 5 S-55s.

Mackey Airlines, Inc. Executive Offices: Broward County Int'l Airport, Fort Lauderdale, Fla. Equipment: 2 DC-3s; 3 DC-4s. On order: 2 Fairchild F-27s.

Mohawk Airlines, Inc. Oneida County Airport, Utica, N.Y. Equipment: 10 DC-3s; 11 Convair 240s.

National Airlines, Inc. P.O. Box NAL, International Airport Branch, Miami 48, Fla. Equipment: 4 DC-7s; 8 DC-6Bs; 4 DC-6s; 12 Convair 340s; 6 Convair 440s; 10 Lockheed Lodestars; 4 DC-7Bs; 4 Lockheed 1049Hs. On order: 23 Lockheed Electras; 6 DC-8s.

New York Airways, Inc. La Guardia Airport Station, Fushing 71, N.Y. Equipment: 5 S-55s; 3 S-58s; 1 Bell 47H.

North Central Airlines, Inc. 6201 34th Ave., South Minneapolis 50, Minn. Equipment: 26 DC-3s.

Northeast Airlines, Inc. Logan Int'l Airport, 239 Prescott St., E. Boston 28, Mass. Equipment: 10 DC-6Bs; 6 Convair 240s; 11 DC-3s. On order: 5 Bristol Britannias.

Northern Consolidated Airlines, Inc. Box 6133, Int'l Airport, Anchorage, Alaska. Equipment: 4 DC-3s; 10 Cessna T-50s. On order: 3 Fairchild F-27s.

Northwest Airlines, Inc. 1885 University Ave., St. Paul 1, Minn. Equipment: 9 B-377s; 17 DC-6Bs; 11 DC-4s; 5 DC-3s; 9 DC-7Cs. On order: 11 DC-7Cs; 5 DC-6Bs.

Ozark Air Lines, Inc. Box 6007, Lambert Field, St. Louis 21, Mo. Equipment: 20 DC-3s.

Pacific Air Lines, Inc. San Francisco Int'l Airport, San Francisco, Calif. Equipment: 7 Martin 2-0-2s; 10 DC-3s; 1 Lockheed 12A.

Pacific Northern Airlines, Inc. 1626 Exchange Bldg., Seattle 4, Wash. Equipment: 4 Lockheed 749s; 2 DC-4s; 4 DC-3s.

Pan American World Airways, Inc. 135 East 42nd St., New York 17, N.Y. Atlantic Division Equipment: 8 B-377s; 17 DC-7Cs; 9 DC-4s; 20 DC-6Bs; 1 DC-6A; 3 DC-7Bs; 1 DC-3. Latin American Division Equipment: 7 DC-7Bs; 2 DC-6As; 26 DC-6Bs; 5 Convair 240s; 13 DC-4s; 2 DC-3s. Pacific-Alaska Division Equipment: 16 B-377s; 3 DC-4s; 9 DC-7Cs. On order: 23 Boeing 707s; 25 DC-8s.

Pan American-Grace Airways, Inc. 135 East 42nd St., New York 17, N.Y. Equipment: 5 DC-7Bs; 5 DC-6Bs; 5 DC-6s; 2 DC-4s; 4 DC-3s.

Piedmont Airlines. Smith Reynolds Airport, Winston-Salem 1, N.C. Equipment: 21 DC-3s.

Reeve Aleutian Airways, Inc. Box 559, Anchorage, Alaska. Equipment: 2 DC-3s; 2 Sikorsky S-43s; 1 Grumman G-21A; 1 DC-4; 1 C-46.

Resort Airlines, Inc. 1346 Connecticut Ave., N.W., Washington 6, D.C. Equipment: 9 DC-4s; 2 Lockheed 1049Hs.

Riddle Airlines, Inc. Int'l Airport, Miami, Fla. (Mail: P.O. Box 535, Int'l Airport Branch, Miami 48, Fla.) Equipment: 34 C-46s; 4 DC-4s.

Safeway Airways. Merrill Field, Anchorage, Alaska. Equipment: Grumman G-44; Piper Apache; Piper Pacers; Piper Super Cubs; Stinsons.

Samoa Airlines, Ltd. 1425 Liholiho St., Honolulu, T. H. On order: 2 Frye F-1s. (Company not operating).

Seaboard & Western Airlines, Inc. 80 Broad St., New York 4, N.Y. Equipment: Lockheed 1049Ds; Lockheed 1049Hs; DC-4s.

Slick Airways, Inc. 3415 Cedar Springs Rd., Dallas, Tex. Equipment: 5 DC-6As; 7 DC-4s.

Southern Airways, Inc. Atlantic Airport, Atlanta, Ga. Equipment: 13 DC-3s.

Trans Caribbean Airways, Inc. 200 W. 57th Street, New York 19, N.Y. Equipment: 3 DC-6A/Bs; 3 DC-4s; 2 C-46s. On order: 1 DC-8.

Trans World Airlines, Inc. 380 Madison Ave., New York 17, N.Y. Equipment: 8 DC-4s; 32 Lockheed 049s; 12 Lockheed 749s; 27 Lockheed 749As; 9 Lockheed 1049s; 28 Lockheed 1049Gs; 11 Martin 2-0-2As; 37 Martin 4-0-4s; 1 Fairchild C-82; 25 Lockheed 1649As. On order: 33 Boeing 707-120s; 30 Convair 880s.

Trans-Pacific Airlines, Ltd. (The Aloha Airline). P.O. Box 3769, Honolulu, T. H. Equipment: 8 DC-3s.

Trans-Texas Airways. International Airport, Houston 17, Tex. Equipment: 20 DC-3s.

United Air Lines, Inc. Executive Offices: 5959 S. Cicero Ave., Chicago 38, Ill. Equipment: 55 Convair 340s; 5 DC-6As; 6 DC-4s; 42 DC-6s; 40 DC-7s; 37 DC-6Bs. On order: 16 DC-7s; 4 DC-6Bs; 40 DC-8s; 2 DC-6As; 11 Boeing 720s.

West Coast Air Lines, Inc. Boeing Field, Seattle 8, Wash. Equipment: 14 DC-3s.

Western Air Lines, Inc. 6060 Avion Drive (P.O. Box 45005 Airport Station), Los Angeles 45, Calif. Equipment: 5 DC-3s; 9 Convair 240s; 21 DC-6Bs.

Wien Alaska Airlines, Inc. Box 649, Fairbanks, Alaska. Equipment: 4 C-46s; 3 DC-3s; 5 Noorduyns; 2 Cessna 195s; 3 Cessna 170s; 1 Cessna 180.

CANADA

Canadian Pacific Air Lines, Ltd. Head Office: Vancouver Airport, B.C. Equipment: Otters; DC-3s; C-46s; Convoirs; PBys; DC-6Bs. On order: 4 DC-6Bs; 6 Britannias.

Laurentian Air Services, Ltd. P.O. Box 71, Ottawa, Ont. Equipment: 7 Beavers; 1 Cessna 180; 1 Grumman G-21A.

Leavens Bros. Ltd. Head Office: 3220 Dufferin St., Toronto, Ont. Equipment: 31 single-engine and 5 twin-engine aircraft.

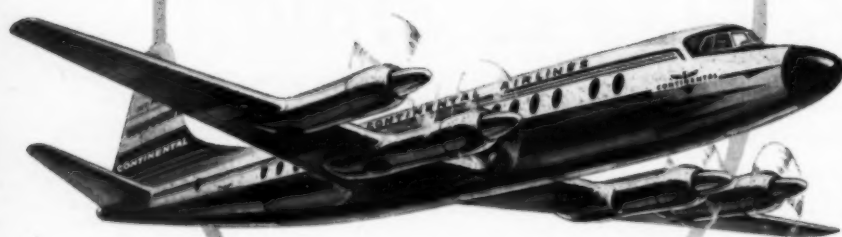
Maritime Central Airways, Ltd. Charlottetown, P. E. Island. Equipment: 8 DC-3s; 3 C-46s; 1 Beaver; 1 York; 3 DC-4s; 3 Beech C-18s.

Matane Air Services, Ltd. Box 700, Matane, Que. Equipment: 4 Lockheed 10s; 1 Cessna T-50.

Nordair, Ltd. Roberval, P. Q. Equipment: 1 DC-4; 1 C-46; 3 DC-3s; 3 PBys; 3 Norsemen; 1 Fairchild Husky; 1 Seabee; 1 Cessna 180; 3 Beavers.

Northern Wings, Ltd. Room 401, 130 St.

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Continental continues DC-7B Club Coach Service between Chicago, Kansas City, Denver and Los Angeles.



AIRLINE DIRECTORY

Jean St., Quebec, P. Q. Equipment: 2 DC-3s; 2 PBYS; 4 Beavers; 3 Norsemen; 1 Anson.

Okanagan Helicopters, Ltd. Vancouver Airport, B. C. Equipment: 13 Bell 47Ds; 7 Bell 47Gs; 5 S-55s; S-58s.

Pacific Western Airlines, Ltd. Vancouver Airport, B.C. Equipment: 92 aircraft including Beavers; DC-3s; DC-4s; C-46s; Helicopters.

Quebecair, Inc. Rimouski, P. Q. Equipment: 8 DC-3s; 2 PBYS; 1 Beech 18.

Saskatchewan Government Airways, P.O. Box 850, Prince Albert, Sask. Equipment: 2 DC-3s; 4 Norsemen; 5 Beavers; 9 Cessna 180s; 1 Cessna 170; 1 Otter; 1 Super Cub.

Transair, Ltd. Head Office: No. 5 Hangar, Stevenson Airport, Winnipeg 12, Manitoba. Equipment: 1 DC-4; 1 Bristol 170; 1 York; 4 PBYS; 1 Lockheed; 2 Ansons; 16 Norsemen; 3 Beavers; 4 Cessna 180s; 1 Bellanca Airbus; 3 DC-3s.

Trans-Canada Air Lines. Executive Offices: International Aviation Bldg., 1080 University St., Montreal, P. Q. Equipment: 18 DC-3s; 21 North Stars; 11 Super Constellations; 32 Viscounts. On order: 19 Viscounts; 6 DC-8s; 20 Vanguards.

Wheeler Air Lines, Ltd. St. Jovite Station, Quebec. Equipment: 4 DC-4s; 2 C-46s; 4 DC-3s; 2 PBYS; 3 Otters; 4 Beavers; 4 Norsemen; 1 Cessna 180; 7 Stearman Sprayplanes; 1 Twin-Beech; 2 S-55s; 3 S-51s. On order: 2 Fairchild F-27s.

MEXICO

Aerolineas Mexicanas, S. A. Blvd. Aeropuerto, Central 161, Mexico D. F. Equipment: 2 DC-3s. On order: 2 DC-3s.

Aeronaves De Mexico, S. A. (Aeronaves). Balderas 32, Mexico, D. F. Equipment: 4 Convair 340s; 3 DC-4s; 16 DC-3s; 2 Britanias.

Aero Transportes, S. A. (ATSA), Juarez No. 117-A, Mexico, D. F. Equipment: 1 DC4 (leased from Cia Mexicana De Aviacion).

Cia. Mexicana De Aviacion, S. A. (Mexicana). Balderas 36, P.O. Box 901, Mexico, D. F. Equipment: 4 DC-7Cs; 4 DC-6s; 6 DC-4s; 19 DC-3s; 3 C-82s.

Guest Aerovias Mexico, S. A. Paseo de la Reforma, 95, Mexico, D. F. Equipment: 2 Lockheed 749s; 1 DC-4; 2 C-82s.

Trans Mar De Cortes, S. A. Avenida Sordan 227-229, P. O. Box 54, Guaymas, Sonora. Equipment: 3 DC-3s.

EUROPE

AZORES

Sociedade Acoriana de Transportes Aereos, LDA (SATA), Rua dos Mercadores, 7-11, Ponta Delgada. Equipment: Doves.

BELGIUM

Sobelair (Societe Belge de Transports Par Air, S. A.), 137 Rue Royale, Brussels. Equipment: 2 DC-4s; 3 Cessna 310s.

Sabena Belgian World Airlines. (Societe Anonyme Belge D'Exploitation de la Navigation Aerienne), Air Terminus, Brussels. Equipment: 3 DC-6s; 8 DC-6Bs; 2 DC-6s; 3 DC-7s; 12 Convair 440s; 7 DC-4s; 4 Convair 240s; 27 DC-3s; 3 Piper Cubs; 2 Tiger Moths; 1 Auster; 5 Safirs; 4 S-58s. On order: 7 DC-7Cs; 4 S-58s; 4 Boeing 707s.

BULGARIA

Transport Aerien Civil Bulgare (TAB SO).

AIRLINE DIRECTORY

12 Place Narodno, Sabranie, Sofia. Equipment: Li-2s.

CZECHOSLOVAKIA

Ceskoslovenske Aerolinie (Czechoslovak Airlines). 1 Namesti Republiky, Prague. Equipment: DC-3s and IL-12s.

FINLAND

Aero O/Y (Finnair). Mannerheimintie 9B, P. O. Box 278, Helsinki. Equipment: 3 Convair 340s; 1 Convair 440; 10 DC-3s. On order: 2 Convair 440s.

Karhumaki Airways. Lonnrotinkatu 3, Helsinki. Equipment: 3 DC-3s; 1 Lodestar. On order: 1 Convair 440.

FRANCE

Bahamas Helicopters, Ltd. 85 Rue Jouffroy, Paris 17^e. Equipment: 19 Bell Helicopters; 7 Sikorsky Helicopters.

Compagnie Nationale Air France. 2 Rue Marbeuf, Paris 8^e. Equipment: 22 Super Constellations; 16 Constellations; 21 DC-4s; 12 Breguet 763s; 11 Viscounts; 39 DC-3s; 8 Lockheed 1649As. On order: 2 Lockheed 1649As; 12 Caravelles; 17 Boeing 707s.

Societe Auxiliaire de Gerance et de Transports Aeriens (SAGETA). 12, Blvd. de la Madeleine, Paris (9^e). Equipment: 6 SE-210 Armagnacs.

Transports Aeriens Intercontinentaux (TAI). 23 Rue de la Paix, Paris 2^e. Equipment: 5 DC-6Bs; 2 DC-4s. On order: 2 DC-7Cs; 2 DC-8s.

Union Aeromarine de Transport (UAT). 5 Blvd. Malesherbes, Paris 8^e. Equipment: 7 DC-6Bs; 1 DC-4; 8 Herons; 4 Nord 2502s. On order: 2 DC-6Bs; 2 DC-8s; 3 Nord 2502s.

GERMANY (EAST)

East German Lufthansa. Schonefeld Airport, Berlin. Equipment: IL-14s.

GERMANY (WEST)

Deutsche Flugdienst. Frankfurt/M., Flughafen. Equipment: 4 Vikings; 5 Convair 240s.

Deutsche Lufthansa Aktiengesellschaft (Lufthansa). Claudiusstrasse 1, Koeln. Equipment: 8 Super Constellations; 4 Convair 340s; 5 Convair 440s; 4 Lockheed 1649As; 8 Chipmunks; 3 DC-3s; 2 Safirs; 2 Bonanzas. On order: 9 Viscounts; 4 Boeing 707s.

Deutsche Lufttransport Gesellschaft m.b.H. Fuhlbuttel Airport, Hamburg. Equipment: DC-3s.

GIBRALTAR

Gibraltar Airways, Ltd. (GIBAIR). Cloister Bldg. Box 212, Irish Town. Equipment: DC-3s.

GREAT BRITAIN

Air Charter, Ltd. 21 Wigmore St., London W. 1. Equipment: 3 DC-4s; 9 Bristol 170s; 6 Super Traders.

Air Kruse, Ltd. (Trans Channel Airways). Farnfield Airport, Lydd, Kent. Equipment: 6 DC-3s; 3 Bristol 170s. On order: 6 Herolds.

Airviews, Ltd. Manchester Airport, Wythenshawe. Equipment: 1 Auster; 2 Rapides; 1 Dove.

Airwork, Ltd. Airwork House, 35 Piccadilly, London W. 1. Equipment: 4 Hermes Mk. IVs; 7 Vikings; 4 Bristol 170s; 12 DC-3s;

APRIL 21, 1958



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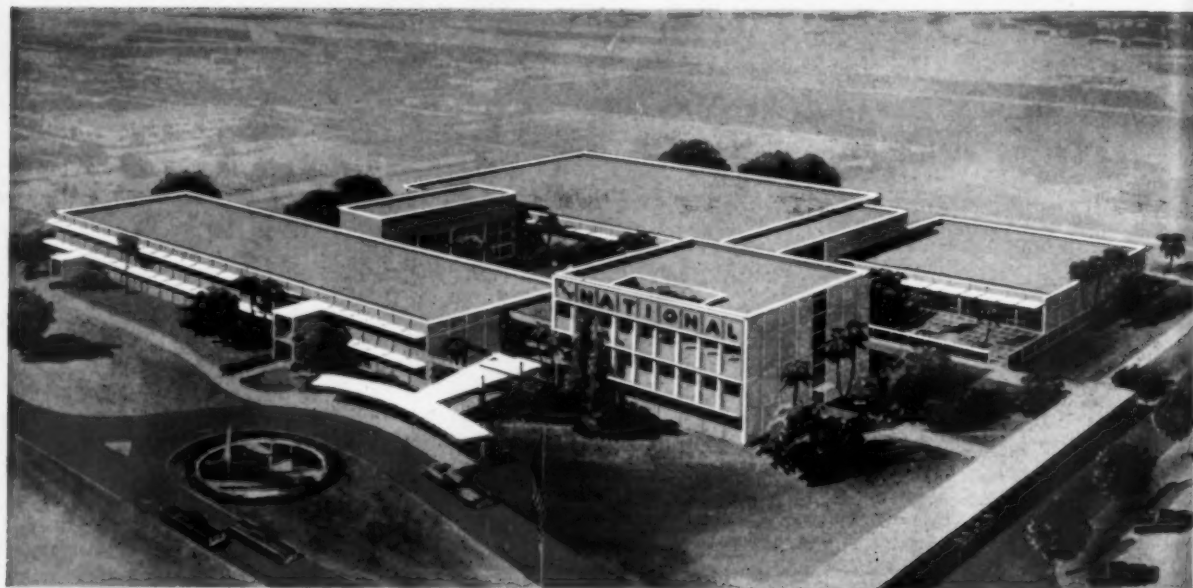
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PRESIDENT, NATIONAL AIRLINES INC.

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AIRLINE DIRECTORY

Consults: Doves; Austers and other small aircraft.

Aquila Airways, (Div. of Britavia, Ltd.). 1 Great Cumberland Place, London W. 1. Equipment: 4 Solents.

Autair, Ltd. 75 Wigmore St., London W. 1. Equipment: 3 Bell 47G2s; 3 Bell 47Ds.

B. K. S. Air Transport, Ltd. 1, Marylebone High St., London W. 1. Equipment: 5 DC-3s; 3 Vikings.

British European Airways Corp. (BEA). Head Office: Keyline House, South Ruislip, Middx. Equipment: 48 Viscounts; 46 DC-3s; 14 Ambassadors; 3 Rapides; 3 Herons; 4 Helicopters. On order: 18 Viscounts; 20 Vanguard; 6 Comets.

British Overseas Airways Corp. (BOAC). London Airport, Hounslow, Middlesex. Equipment: 17 Argonauts; 16 Boeing 377s; 14 Constellations; 10 DC-7Cs; 18 Britannias. On order: 15 Britannias; 19 Comets; 15 Boeing 707s; 35 Vickers VC-10s.

Cambrian Airways, Ltd. Cardiff (Rhoose) Airport, Glam. South Wales. Equipment: 2 DC-3s; 3 Herons; 3 Doves; 2 Rapides; 3 Proctors; 1 Auster.

Dan-Air Services: 36/38 New Broad St., London E.C. 2. Equipment: 4 Yorks; 2 DC-3s; 1 Bristol 170.

Derby Aviation, Ltd. Derby Airport, Burnaston, Derby. Equipment: 3 DC-3s; 3 Marathons; 2 Ansons.

Dragon Airways, Ltd. Woolsington Airport, Newcastle-on-Tyne. Equipment: 3 Herons; 1 Viking.

Eagle Airways, Ltd. Eagle Aviation, Ltd. Marble Arch House, 32-50 Edgware Rd., London W. 2. Equipment: 20 Vikings.

East Anglian Flying Services, Ltd. Airport, Southend-on-Sea, Essex. Equipment: 5 Doves; 2 Rapides; 2 Bristol 170s; 2 Proctors; 1 Tiger Moth; 2 Austers.

Don Everall (Aviation) Ltd. Elmdon Airport, Birmingham. Equipment: 1 DC-3; 3 Rapides; 1 Messenger; 1 Auster.

Hunting-Clan Air Transport, Ltd. London Airport, Hounslow, Middlesex. Equipment: 3 Viscounts; 9 Vikings; 3 Yorks; 5 DC-3s. On order: 2 Britannias.

Jersey Airlines. The Airport, Jersey, C. I. Equipment: 7 Herons; 1 Bristol 170.

Lancashire Aircraft Corp., Ltd. 7 Berkeley St., London W. 1. Equipment: 2 DC-3s; 3 Rapides; 3 Consul; 1 Auster; 1 DH-86; 1 Proctor.

Manx Airlines, Ltd. Ronaldsway Airport, Isle of Man. Equipment: 4 Bristol 170s; 1 Rapide; 2 Herons.

Morton Air Services, Ltd. Croydon Airport, Surrey. Equipment: 7 Doves; 2 Consul; 3 Rapides; 1 Heron.

Oiley Air Service, Ltd. Croydon Airport, Surrey. (Controlled by Morton Air Services, Ltd.).

Scottish Airlines (Prestwick) Ltd. Prestwick Airport, Ayrshire, Scotland. Equipment: 3 Yorks; 1 DC-3. On order: 6 Twin Pioneers.

Silver City Airways, Ltd. 11 Great Cumberland Place, London W. 1. Equipment: 15 Bristol 170s; 1 Consul; 1 Dragonfly. On order: 5 Bristol 170s.

Skyways, Ltd. 7 Berkeley St., London W. 1. Equipment: 9 Hermes; 12 Yorks; 4 DC-3s.

Starways, Ltd. Liverpool Airport, Liverpool 19. Equipment: 4 DC-3s.

Transair, Ltd. Croydon Airport, Surrey. Equipment: 11 DC-3s. On order: 2 Viscounts.

GREECE

TAE National Greek Airlines (Technical and Aeronautical Exploitations Co. Ltd.). 12 Merlin St., Athens. Equipment: 1 DC-4; 14 DC-3s; 1 Fairchild.

HUNGARY

Malev (Hungarian Air Transport). 5 Vorosmarty-ter, Budapest. Equipment: Li-2s.

ICELAND

Flugfelag Islands, H. F. (Iceland Airways, Ltd.). Laekjargata 4, Reykjavik. Equipment: 3 DC-3s; 1 DC-4; 2 PBys; 1 Grumman G-21A; 2 Viscounts.

Loffleidir—The Icelandic Airlines. P.O. Box 476, Laekjargata 2, Reykjavik. Equipment: 4 DC-4s.

IRELAND

Aer Lingus TTA (ALT). 43 Upper O'Connell St., Dublin. Equipment: 6 Viscounts; 13 DC-3s. On order: 1 Viscount; 5 Fokker F-27s.

ITALY

Aerolinee Italiane Internazionali (ALITALIA). Via Leonida Bissolati, 20, Rome. Equipment: 6 DC-6Bs; 2 Convair 440s; 4 Convair 340s. On order: 4 DC-7s; 4 DC-8s.

LAI—Linee Aeree Italiane (Italian Airlines). Via Del Tritone, 132, Rome. Equipment: 16 DC-3s; 3 DC-6s; 3 DC-6Bs. On order: 4 Super Constellations; 10 Viscounts.

NETHERLANDS

KLM Royal Dutch Airlines (Koninklijke Luchtvaart Maatschappij N. V.). Plesmanweg 1, P.O. Box 121, The Hague. Equipment: 10 Lockheed 1049Gs; 7 Lockheed 1049Cs; 5 DC-4s; 6 DC-6s; 1 DC-6A; 7 DC-6Bs; 10



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**WEST COAST
AIRLINES**

AIRLINE DIRECTORY

DC-7Cs; 9 Viscounts; 2 Convair 240s; 14 Convair 340s; 15 DC-3s. On order: 1 DC-7C; 3 Lockheed 1049Hs; 2 Fokker F-27s; 12 Lockheed Electras; 8 DC-8s.

NORWAY

Braathens South—American & Far East Air-transport A/S (SAFE). Fr. Nensenspl. 7, Oslo. Equipment: 2 DC-4s; 1 DC-3; 3 Herons. On order: 3 Fokker F-27s.

Fred. Olsen Airtransport, Ltd. Fred. Olsen's gate 2, Oslo. Equipment: 2 Viscounts; 3 C-46s; 2 DC-3s.

Vestlandske Luftfartsselskap A/S (West Norway Airlines). Trafikkontor Airport, Bergen. Equipment: 2 Sealands; 2 Seabees; 1 Heron; 1 Piper Cub.

Wideroe's Flyveselskap Og Polarfly A/S. Kr. Augustsgat 19, Oslo. Equipment: 2 Otters; 4 Norsemen. On order: 2 Otters.

POLAND

Polskie Linie Lotnicze (LOT). Hoza Str., 39, LOT Bldg., Warsaw. Equipment: Li-2s; IL-12s; IL-14s; Aero 45s; CSS 13s; 3 Convair 240s.

PORTUGAL

TAP—Transportes Aereos Portugueses, S.A.R.L. 2 Rua Braacamp, Lisbon. Equipment: 3 DC-4s; 6 DC-3s; 3 Lockheed 1049Gs.

ROMANIA

Transporturi Aeriene Romine (TAROM). Baneasa Airport, Bucharest. Equipment: Li-2s; IL-12s; IL-14s.

SPAIN

Aviacion y Comercio S. A. 33 Calle Aduana, Madrid. Equipment: 5 Languedocs; 5 Bristol 170s. On order: 8 Herons.

Iberia (Lineas Aereas Espanolas). Avenida de America No. 2, Madrid. Equipment: 5

Lockheed 1049Gs; 5 Convair 440s; 6 DC-4s; 17 DC-3s; 4 Bristol 170s; 2 Ju-52s; 2 Consuls.

SWEDEN

Aero—Nord Sweden AB. Bromma Airport, Stockholm 40. Equipment: 1 Oxford; 1 Aero Commander; 2 Piper Cubs. On order: 1 Aero Commander.

Airtaco AB. Bromma Airport, Stockholm 40. Equipment: 4 Lockheed Lodestars; 4 DC-3s; 1 Lockheed 12A.

Föreningen Ostgotaflyg. c/o Linköpings Flygklubb, Saab, Linköping. Equipment: 2 Super Cubs.

Linjflyg AB. Bromma Airport, Stockholm 40. Equipment: 4 Lockheed Lodestars; 9 DC-3s.

AB Nordisk Aerotjänst (NORDAERO). Kungälv Flygplats, Norköping. Equipment: 1 Stinson Voyager.

AB Malmö Flygindustri. Bulltofta Airport, Malmö 12. Equipment: 1 Topsy; 1 Auster.

Astermans Aero AB. Stockholm 7. Equipment: 12 Bell 47s; 2 S-55s; 2 Seabees.

Scandinavian Airlines System. Head Office, Bromma Airport, Stockholm 40. Equipment: 14 DC-6Bs; 12 DC-6s; 8 Scandias; 10 DC-3s; 11 DC-7Cs; 16 Convair 440s. On order: 3 DC-7Cs; 7 DC-8s.

Svenska Aero, K. O. Gustavson AB. Bromma Airport, Stockholm 40. Equipment: 1 Rapide. On order: 1 Rapide.

SWITZERLAND

Swissair (Swiss Air Transport Co., Ltd.). Hirschengraben 84, P.O. Box 929, Zurich. Equipment: 6 DC-6Bs; 11 Convair 440s; 3 DC-4s; 8 DC-3s; 3 DC-7Cs. On order: 2 DC-7Cs; 3 DC-8s; 1 DC-6A.

U.S.S.R.

Aeroflot (Russian Air Lines). Uliza Razina 9. Equipment: Li-2s; IL-12s; IL-14s; Tu-104s; Tu-110s.

YUGOSLAVIA

Jugoslovenski Aerotransport (JAT). Birčaninova 1/111, Belgrade. Equipment: 13 DC-3s; 2 Convair 340s.

CENTRAL & SOUTH AMERICA

ARGENTINA

Aerolineas Argentinas. Paseo Colon 185, Buenos Aires. Equipment: 6 DC-6s; 5 DC-4s; 4 Convair 240s; 7 Sandringhams; 16 DC-3s.

Lineas Aereas Del Estado. (LADE). Corrientes 480, Buenos Aires. Equipment: DC-3; DC-4; Viking.

Transcontinental S. A. Cerrito 1117, Buenos Aires. Equipment: 5 C-46s; 3 Lockheed 1049Hs.

BAHAMA ISLANDS

Bahama Airways, Ltd. (BAL). Box 65, Windsor Field, Nassau. Equipment: 2 Grumman G-21As; 1 PBV; 3 Herons.

BERMUDA

Eagle Airways (Bermuda) Ltd. Radio Center Bldg., Bermudiana Road, Hamilton. Equipment: 2 Viscounts. (Starts operations May 1, 1958.)

BOLIVIA

Lloyd Aereo Boliviana S. A. (LAB). Casilla 132, Cochabamba. Equipment: 6 Boeing B-17s; 2 DC-4s; 10 DC-3s.

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BRAZIL

Aerovias Brasil, S. A. (Brazilian International Airlines) (BIA). Rua Consolheiro, Crispiniano 79-2, Sao Paulo. Equipment: 57 DC-3s; 3 DC-4s; 8 Convairs. On order: 10 Convair 440s.

Empresa De Transportes Aereos Catarinense, S. A. (TAC). Felipe Schmidt 14, Florianopolis, Santa Catarina. Equipment: DC-3s. On order: DC-3s.

Loide Aereo Nacional S. A. (LOIDE). Av. 13 de Maio, 13-27th floor, Rio de Janeiro. Equipment: 21 C-46s. On order: 4 DC-6Cs.

Panair Do Brasil, S. A. Edificio Panair, Aeroporto Santos-Dumont, Caixa Postal 694, Rio de Janeiro. Equipment: 10 Constellations; 5 PBYS; 16 DC-3s. On order: 4 DC-7Cs.

REAL S. A. Transportes Aereos. Rua Consolheiro, Crispiniano 379-2nd, Sao Paulo. Equipment: 86 DC-3s; 6 Convair 340s; 4 Convair 440s; 4 DC-4s; 10 C-46s. On order: 10 Convair 440s; 4 Lockheed 1049Hs; 4 Convair 880s; 3 DC-3s.

S. A. Empresa De Viacao Aereo Rio Grandense (VARIG). Av. Borges de Medeiros 410-16th and P. O. Box 243, Porto Alegre, RGS. Equipment: 24 DC-3s; 14 C-46s; 10 Convair 240s; 5 Lockheed 1049Gs. On order: 2 Boeing 707s; 2 Caravelles.

S. A. Viacao Aerea Gaucha (SAVAG). Edificio Camara do Comercio, Rio Grande Do Sul. Equipment: DC-3s.

Sadia S/A Transportes Aereos. Sao Bento 470-13, Sao Paulo. Equipment: DC-3s.

Servicos Aereos Cruzeiro Do Sul, S. A. (CRUZEIRO). Avenida Rio Branco, 128, P. O. Box 190, Rio de Janeiro. Equipment: 34 DC-3s; 6 AT-11s; 1 Convair 340. On order: 3 Convair 340s; 10 Safaris.

Viacao Aerea Sao Paulo S. A. (VASP). Rua Libero Badaro, 89, Sao Paulo. Equipment: 16 DC-3s; 9 Scandias; 1 Beechcraft.

BRITISH GUIANA

British Guiana Airways, Ltd. P. O. Box 102, Georgetown. Equipment: Goose aircraft and DC-3s.

BRITISH HONDURAS

British Honduras Airways. 7 Cork St., P. O. Box 186, Ft. George, Belize. Equipment: 4 Cessnas.

CHILE

ALA—Sociedad De Transportes Aereos Ltda. Teatinos 304, Santiago. Equipment: 4 C-46s; 6 UT-8s; 1 C-87; 1 T-17.

Cia Nacional De Turismo Aereo Cinta (Chilean Airlines). Hotel Carrera, Santiago. Equipment: 1 C-46; 2 DC-3s; 2 DC-4s; 2 Lockheed 10s; 2 Bonanzas.

Linea Aerea Nacional De Chile (LAN). Los Cerrillos, Santiago. Equipment: 3 DC-6Bs; 4 Martin 2-0-2s; 18 DC-3s; 2 Lockheed 10s; 1 Bonanza. On order: 4 DC-6Bs.

Transa Chile Ltda. (Transportes Aereos De Chile). Agustinas 1161, Local 4, Oficinas 21-23, Santiago. Equipment: 3 C-46s; 2 PBYS.

COLOMBIA

Aerovias Nacionales De Colombia, S. A. (Avianca). Carrera 7, No. 16-14, Bogota. Equipment: 3 Super Constellations; 12 DC-4s; 33 DC-3s.

Lineas Aereas Nacionales Consolidadas, S. A. (LANSA). Calle 34, No. 45-23, Barranquilla. Equipment: 16 DC-3s.

Lloyd Aereo Colombiano. Bogota. Equipment: DC-3s; Cessna 310s.

Rutas Aereas Sam, Ltda. (RAS). Calle 51, No. 53-34, Apartado Aereo 1912, Medellin. Equipment: 3 DC-4s; 3 DC-3s.

Sociedad Aeronautica Medellin S. A. (SAM). Calle 51, No. 53-34, Apartado Aereo 1085, Medellin. Equipment: 6 C-46s; 3 DC-3s.

COSTA RICA

Lineas Aereas Costarricenses, S. A. (LAC-SA). Avenida la No. 39 E., Box 1531, San Jose. Equipment: 3 DC-3s; 4 C-46s; 2 Convair 340s.

CUBA

Aerovias "Q," S. A. Cienfuegos 72, Havana. Equipment: 2 DC-3s; 4 C-46s.

Compania Cubana De Aviacion, S. A. (Cubana). Jose Marti Int'l Airport, Rancho Boyeros, Havana. Equipment: 2 Lockheed 1049Gs; 1 Lockheed 049; 3 Viscounts; 6 DC-3s. On order: 4 Viscounts; 2 Britannias; 2 Boeing 707s.

Cuba Aeropostal, S. A. Apartado Postal 302, Havana. Equipment: 3 C-46s.

Expreso Aereo Inter Americano, S. A. (Expreso). Rancho Boyeros Airport, Rancho Boyeros, Havana. Equipment: 3 C-46s. On order: 3 C-46s.

DOMINICAN REPUBLIC

Campania Dominicana De Aviacion, C. por A. (CDA). General Andrew Airport, Ciudad Trujillo. Equipment: 5 C-46s; 2 DC-3s; 1 Beaver.

ECUADOR

Aerovias Ecuatorianas C. A. (AREA). Calle Benalcazar No. 675, P. O. Box 2226, Quito. Equipment: 2 Boeing 307s; 5 Ansons; 4 DC-3s; 3 Navions.

Ecuadorian National Airlines. Calle Venezuela 666, Casille 3188, Quito. Equipment: 4 C-46s; 2 DC-4s. On order: 2 C-46s.

EL SALVADOR

Taca International Airlines, S. A. San Salvador. Equipment: DC-4s; Viscount; C-46.

GUATEMALA

Empresa Guatemalteca De Aviacion (AVIA-TECA). 12 Calles Poniente 6, Guatemala City. Equipment: 6 DC-3s; 1 DC-4. On order: 1 DC-4; 6 DC-3s.

HAITI

Compagnie Haitienne de Transports Aeriens. Bower Field, Port-au-Prince, Haiti. Equipment: Beech D-18; DC-3; Boeing 307.

HONDURAS

Servicio Aereo De Honduras, S. A. (SAH-SA). Avenida Colony, Cuarta Calle, Tegucigalpa, D.C. Equipment: 7 DC-3s.

Transportes Aereos Nacionales, S. A. (TAN). Edificio Marichal, Tegucigalpa, D.C. Equipment: 5 C-46s.

NETHERLANDS WEST INDIES

KLM Royal Dutch Airlines, Caribbean Div. KLM Bldg., Dr. Albert Plesman Airport, Curacao, N. A. Equipment: 2 Convair 340s; 4 DC-3s; 3 DC-6s.

NICARAGUA

Lineas Aereas De Nicaragua, S. A. (LANICA). Managua. Equipment: 6 DC-3s; 2 C-46s; 1 Beech D-18. On order: 1 DC-4.

PANAMA

Aerovias Panama, S. A. (APA). Calle B, El Cangrejo, Panama, R. P. Equipment: DC-4; C-46s.

Cia Panamena De Aviacion (COPA). 25 Avenida Peru, Panama, R. P. Equipment: 2 DC-3s; 2 C-46s.

AÉROPORT DE PARIS



AIRLINE DIRECTORY

PERU

Compania De Aviacion "Faucett," S. A. Hotel Bolivar 926, P.O. Box 1429, Lima. Equipment: 4 DC-4s; 8 DC-3s; 4 Faucett monoplanes.

Grupo Del Transportes. 1414 Limatambo Airport, Lima. Equipment: 8 DC-3s; 6 Rapides; 3 Stinsons; 1 Beechcraft; 4 PBys; 4 Beavers.

TRINIDAD

British West Indian Airways, Ltd. (BWIA). Airways House, 17 Chacon St., Port-of-Spain. Equipment: 8 Viscounts; 4 DC-3s.

URUGUAY

Campania Aeronautica Uruguay, S. A. (CAUSA). Calle Colonia 1068, Montevideo. Equipment: 3 Sandringhams.

Primeras Lineas Uruguayas De Navegacion Aerea (PLUNA). Colonia 1013, Montevideo. Equipment: 6 DC-3s; 4 Herons. On order: 3 Viscounts.

VENEZUELA

Aerovias Venezolanas, S. A. (AVENSA). Apartado de Correo, 943, Caracas. Equipment: 18 DC-3s; 3 C-46s; 5 Convair 340s.

Linea Aerea Taca De Venezuela C. A. (TACA). Carmelitas a Altigracia, P.O. Box 844, Caracas. Equipment: 13 DC-3s.

Linea Aeropostal Venezolana (LAV). Bloque No. 1, El Silencio, Caracas. Equipment: Constellation; Viscount.

Rutas Aereas Nacionales, S. A. (RANSA). 407 Edificio, America, Caracas. Equipment: 13 C-46s; 1 DC-3; 5 Cessna 180s; 1 Cessna 170; 2 Beavers; 1 Twin Beech.

AFRICA & MIDDLE EAST

ADEN

Aden Airways, Ltd. Khormaksar. Equipment: 8 DC-3s; 1 Rapide. On order: 1 Rapide.

ALGERIA

CGTA-Air Algerie. 46 Bd. St. Saens, Algiers. Equipment: 2 Constellations; 8 DC-4s; 3 DC-3s; 3 Nord Noratlas.

ANGOLA

(Portuguese West Africa)

Divisao De Exploracao Dos Transportes Aereos (DTA). Rua Pereira Forjaz, P.O. Box 79, Luanda. Equipment: 6 DC-3s; 4 Beech D-18s; 3 Rapides.

CYPRUS

Cyprus Airways, Ltd. P.O. Box 403, Nicosia. Equipment: 4 DC-3s; 2 Viscounts.

EGYPT

Misair, S. A. E. Almaza Airport, Heliopolis, Cairo. Equipment: 7 Vikings; 1 Beechcraft; 4 Viscounts; 7 DC-3s.

ETHIOPIA

Ethiopian Airlines, Inc. P.O. Box 1755, Addis Ababa. Equipment: 3 Convair 240s; 7 DC-3s. On order: 3 DC-6Bs.

FRNCH GUIANA

Societe Aerienne De Transport Guyane Antilles (SATGA). 12 Avenue du General de Gaulle, Cayenne. Equipment: 3 Rapides; 1 Cessna UC-78. On order: 1 Rapide; 1 DC-3; 1 Cessna UC-78.

IRAN

Iranian Airways. Avenue Seadi, Teheran. Equipment: 2 DC-4s; 7 DC-3s; 4 Rapides; 2 Doves; 1 Twin Beech; 1 Fairchild; 2 Convair 240s.

IRAQ

Iraq Airways (Iraq State Railway). Baghdad, West. Equipment: 3 Viscounts; 3 Vikings; 1 Dove. On order: 1 Viscount.

ISRAEL

El Al Israel Airlines, Ltd. (El Al). 76 Maza St., P.O. Box 438, Tel Aviv. Equipment: 4 Constellations; 4 Britannias.

Israel Inland Airlines, Ltd. (ARKIA). 42 Maza St., Tel Aviv. Equipment: 4 DC-3s; 1 Beech D-18.

JORDAN

Air Jordan Co. P.O. Box 274, Amman. Equipment: 3 DC-3s; 1 Rapide; 1 C-46.

Arab Airways (Jerusalem) Ltd. (AAJ). King Hussein Rd., P.O. Box 367, Amman. Equipment: 3 DC-3s.

KENYA COLONY

Caspair, Ltd. P.O. Box 2238, Nairobi. Equipment: 3 Rapides; 2 Bonanzas; 1 Cessna 182; 1 Navion; 1 Pacer.

East African Airways Corp. (EAAC). Airways Terminal, Sadler St., Nairobi. Equipment: 9 DC-3s; 4 Rapides; 3 Argonauts. On order: 1 Argonaut.

KUWAIT

Kuwait Airways. P. O. Box 394, Kuwait. Equipment: 2 DC-3s. On Order: 2 Argonauts.

LEBANON

Air Liban. Esseili Bldg., Assour Square, P. O. Box 1243, Beirut. Equipment: 2 DC-4s; 3 DC-3s; 1 Languedoc; 2 DC-6s.

Lebanese International Airways (LIA). Beirut Int'l Airport, Beirut. Equipment: 1 C-46; 1 DC-6A.

Middle East Airlines Co., S. A. (MEA). Yared Bldg., Abdull Aziz St., P. O. Box 206, Beirut. Equipment: 4 DC-3s; 5 Viscounts; 1 Bristol 170; 3 Yorks.

LIBERIA

Liberian National Airways. Robertsfield Airport, Harbel. Equipment: 2 DC-3s.

MOROCCO

Air Atlas-Air Maroc (Compagnie Cherifienne Transports Aeriens). 65 Avenue de l'Armee, Royal. Equipment: 4 DC-4s; 4 DC-3s.

Air Madagascar. 8 Rue General Roques, P. O. Box 437. Equipment: 3 DC-3s; 5 Rapides; 3 Cessna 170s.

Air Outremer. 90 rue Amiral-Courbet, Casablanca. Equipment: Breguet 761s.

MOZAMBIQUE

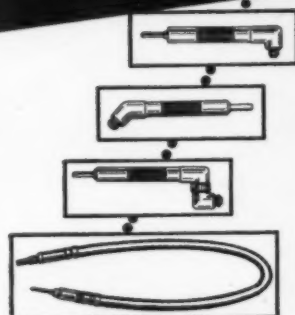
(Portuguese East Africa)

Divisao De Exploracao Dos Transportes Aereos (DETA). Rua Araujo 103-2nd, L. Marques. Equipment: 4 Rapides; 6 Doves; 2 Ju-52s; 3 Lodestars; 3 DC-3s.

NIGERIA

West African Airways Corp. (WAAC). P. O. Box 136, Airways House, Lagos Airport. Equipment: 2 Doves; 8 Herons; 5 DC-3s.

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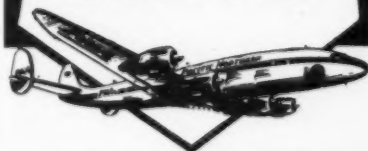
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AIRLINE DIRECTORY

SAUDI ARABIA

Saudi Arabian Airlines, Jidda. Equipment: 10 DC-3s; 5 Bristol 170s; 4 DC-4s; 10 Convair 340s; 2 Beechcrafts; 1 Varsity.

SOUTH WEST AFRICA

Southwest Air Transport, Pty. Ltd., P. O. Box 731, Windhoek. Equipment: 8 Navions; 2 Apaches.

SOUTHERN RHODESIA

Central African Airways Corp. (CAAC). P. O. Box 1979, Salisbury Airport, Salisbury. Equipment: 2 Vikings; 5 DC-3s; 6 Beavers; 5 Viscounts.

Hunting-Clan African Airways (Pvt) Ltd., P. O. Box 179H, Salisbury. Equipment: 2 DC-3s; 3 Rapides. On order: 1 DC-3.

SUDAN

Sudan Airways, Gamhouria Avenue, P. O. Box 253, Khartoum. Equipment: 4 Doves; 5 DC-3s. On order: 2 DC-3s.

SYRIA

Syrian Airways, P. O. Box 417, Damascus. Equipment: DC-3s; Beechcraft; de Havilland; Fairchild.

TUNISIA

Societe Tunisienne De L'Air (Tunis Air). 1 rue d'Athenes, Tunis. Equipment: 2 DC-4s; 3 DC-3s.

TURKEY

Turk Hava Yolları A. O. (Turkish Airlines). Cankiri Caddesi No. 88, Ankara. Equipment: 27 DC-3s; 7 Herons. On order: Viscounts.

UNION OF SOUTH AFRICA

Commercial Air Services (Pty) Ltd. (COMAIR). P. O. Box 2245, Johannesburg. Equipment: 2 Cessna 180s; 2 Cessna 170s; 1 Cessna 140; 3 Lodestars.

South African Airways—Suidafrikaanse Lugdiens, P. O. Jan Smuts Airport, Johannesburg. Equipment: 4 DC-7Bs; 4 Constellations; 7 DC-4s; 6 DC-3s. On order: 7 Viscounts; 3 Boeing 707s.

ASIA & AUSTRALIA

AFGHANISTAN

Aryana Airlines Co. Ltd., P. O. Box 76, Kabul. Equipment: 4 DC-3s; 2 DC-4s.

AUSTRALIA

Ansett Airways Pty. Ltd. (Ansett). Commonwealth Airport, Essendon, Victoria. Equipment: 5 DC-3s; 2 Convair 340s. On order: 4 Convair 440s.

Ansett Airways Pty. Ltd. (Reefair). Flying Boat Div., Civil Aviation Flying Boat Base, Rose Bay, Sydney, N. S. W. Equipment: 2 Sandringhams.

Australian National Airways Pty. Ltd. (ANA). 289 William St., Melbourne, C. I. Equipment: 4 DC-6Bs; 2 DC-6s; 8 DC-4s; 14 DC-3s; 3 Bristol 170s; 1 Sycamore.

Butler Air Transport Ltd. Kingsford Smith Aerodrome, Mascot, Sydney. Equipment: 4 DC-3s; 3 Ambassadors; 2 Viscounts.

Connellan Airways Ltd. Townsite Airport, Alice Springs, N. T. Equipment: 2 Beech C-18s; 1 Rapide; 2 Cessna 180s; 1 Beech D-17.

East-West Airlines Ltd. (EWA). P. O. Box

249, Tamworth Aerodrome, Tamworth, N. S. W. Equipment: 4 DC-3s; 2 Lockheed 18s. On order: 1 DC-3.

Guinea Airways Ltd. (GAL). Airways House, 132 N. Terrace, Adelaide. Equipment: 5 DC-3s; 2 Austers.

MacRobertson Miller Airlines Ltd. (MMA). 194 St. Georges Terrace, Perth, W. Australia. Equipment: 5 DC-3s; 3 Doves; 3 Ansons.

Qantas Empire Airways Ltd. (Qantas). Shell House, Carrington St., Sydney, N. S. W. Equipment: 16 Super Constellations; 5 DC-4s; 8 DC-3s; 2 PBys; 1 Drover; 4 Beavers. On order: 7 Boeing 707s.

Queensland Airlines Pty. Ltd. Brisbane Airport, Brisbane, Queensland. Equipment: 3 DC-3s; On order: Heralds.

Southern Airlines Ltd. No. 8 Hangar, Melbourne Airport, Essendon. Equipment: 2 Doves; 1 Auster.

Trans-Australia Airlines (TAA). 339 Swanston St., Box 2806AA, G.P.O., Melbourne, C. I., Victoria. Equipment: 11 Viscounts; 2 Convair 240s; 4 DC-4s; 19 DC-3s; 4 Drovers; 2 Hiller H-12Cs. On order: 2 Viscounts; 6 F-27s.

Woods Airways Pty. Ltd. National House, 49 William St., Box K 783, G.P.O., Perth. Equipment: 2 Ansons.

BURMA

Union of Burma Airways Board (UBA). 104 Strand Rd., Rangoon. Equipment: 3 Doves; 10 DC-3s; 2 Marathons; 1 Auster; 1 Consul; 1 PBY. On order: 3 Viscounts; 3 DC-3s.

CEYLON

Air Ceylon Ltd., P. O. Box 692, 3 Lotus Rd., Fort, Colombo I. Equipment: 2 DC-3s.

FIJI ISLANDS

Fiji Airways, Box 112, Suva. Equipment: 1 Rapide; 3 Drovers.

FORMOSA

Asiatic Aeronautical Co. Ltd. 46 Chung Shan Rd., N., Second Section, Taipei, Taiwan. Equipment: 5 DC-3s; 18 C-46s; 2 PBys; 3 DC-4s.

Civil Air Transport Co. Ltd. 46 Chung Shan Rd., N., Second Section, Taipei, Taiwan. Equipment: 2 DC-4s; 2 PBys; 18 C-46s; 5 DC-3s. On order: 1 DC-6B.

HONG KONG

Cathay Pacific Airways Ltd. (Cathay). 1 Connaught Rd., Central, Hong Kong. Equipment: 1 DC-6; 1 DC-4; 1 DC-3. On order: 1 DC-6B; 2 Electras.

Hong Kong Airways Ltd. Alexandra House, Hong Kong. Equipment: 2 Viscounts.

INDIA

Air-India International Corp. Registered Office: Mahatma Gandhi Rd., Fort, Bombay I. Equipment: 3 Constellations; 8 Super Constellations; 1 DC-3. On order: 3 Boeing 707s.

Indian Airlines Corp. Thapar House, Janpath, New Delhi. Equipment: 6 DC-4s; 5 Viscounts; 64 DC-3s; 12 Vikings; 8 Herons. On order: 5 Viscounts.

INDONESIA

Garuda Indonesian Airways N. V. Djalat Nusantara 15, Djakarta. Equipment: 8 Convair 340s; 8 Convair 240s; 20 DC-3s. On order: 3 Convair 440s; 3 Electras.

JAPAN

Far Eastern Airlines, Osaka Bldg. 1 Soze-Cho,

Kita-Ku, Osaka. Equipment: Marathons and Doves.

Japan Airlines Co., Ltd. (JAL). Tokyo Bldg. 8, 3-2, 2-chome, Marumouchi Chuoku, Tokyo. Equipment: 5 DC-6Bs; 9 DC-4s; 2 Beechcrafts; 3 Herons. On order: 4 DC-7Cs; 4 DC-8s.

KOREA

Korean National Airlines. Bldg. No. 1, 1-Ka, Chongno, Seoul. Equipment: 3 DC-3s; 1 DC-4.

LAOS

Air Laos. 4 Rue Pierre Morin, P. O. Box 87, Vientiane. Equipment: 6 DC-3s; 2 Boeing 307s; 2 Bristol 170s; 2 Otters; 1 Beaver.

MALAYAN UNION

Malayan Airways Ltd., Airways House, Raffles, Singapore. Equipment: 11 DC-3s; 3 Rapides.

MARIANAS ISLAND

Trust Territory Div., Transocean Air Lines (TALOA). P. O. Box 307, Agana, Guam. Equipment: 3 Grumman SA-16s.

NEW CALEDONIA

Societe Caledonienne de Transports Aeriens. (TRANSPAC). G.P.O. Box 212, Noumea. Equipment: 3 Rapides.

NEW GUINEA

Gibbes-Sepik Airways Ltd. (GSA). Goroka. Equipment: Ju-52; 7 Norsemen. On order: 2 Ju-52s.

Mandated Airlines Ltd. (MANAIR). P. O. Box 25, Lae. Equipment: 5 DC-3s; 3 Dragons.

NEW ZEALAND

New Zealand National Airways Corp. P. O. Box 96, Wellington, C. I. Equipment: 26 DC-3s; 6 Rapides; 4 Herons. On order: 3 Viscounts.

Straits Air Freight Express Ltd. (SAFE). P. O. Box 751, Wellington, C. I. Equipment: 4 Bristol 170s.

Tasman Empire Airways Ltd. (TEAL). Mechanics Bay, G.P.O. Box 2201, Auckland. Equipment: DC-6s and Solents.

PAKISTAN

Pakistan International Airlines Corp. M. A. Khuro Rd., Karachi 4. Equipment: 3 Super Constellations; 4 Convair 240s; 10 DC-3s. On order: 15 Viscounts; 2 Lockheed 1049Hs.

PHILIPPINE ISLANDS

Philippine Air Lines (PAL). M.R.S. Bldg., Plaza Cervantes, Manila. Equipment: Convair 340s; Otters; Hiller Helicopters; 2 Viscounts. On order: 5 Twin Pioneers.

TAHITI

RAI, Regie Aerienne Interinsulaire. c/o Messageries Maritimes, P. O. Box 96, Papeete. Equipment: 1 PBY. On order: 1 PBY.

THAILAND

Thai Airways Co. Ltd. 6 Larn Luang Rd., Bangkok. Equipment: DC-4; DC-3; Norseman; Bonanza. On order: 3 Lockheed 1049Gs.

VIET NAM

Air Vietnam. 116 Blvd. Nguyen-Hue, P. O. Box 217, Saigon. Equipment: 6 DC-3s; 1 Boeing 307.

Societe De Transports Aeriens En Extrême Orient (COSARA). 5-13 rue Turc, Saigon. Equipment: 4 DC-3s; 4 Bretagnes.

19th EDITION 1958

AIR TRANSPORT



FACTS AND FIGURES

OFFICIAL PUBLICATION of the

AIR TRANSPORT ASSOCIATION of America



The Standard Reference of United States Scheduled Air Transportation



THE FIRST TWENTY YEARS

This year's report on the status of the scheduled airlines is both a record of the year just past, and a summing up of two decades of progress.

Because it looks to the past, it can also be called a history. The airline industry, however, has never had time to look into the past. The face of the industry from the very beginning has been firmly fixed to the future.

And what a future lies ahead!

With the inauguration of jet airline service expected late in 1958, the airlines find themselves today at the dawn of an age that will make all previous growth seem almost insignificant by comparison.

It has been the custom of late to refer to the introduction of these new planes as the "Jet Revolution." This is not an apt phrase because the advent of the jets will not come all at once to find the industry unprepared.

Rather, it will be the logical climax to a series of studies that began years ago, long before the first commercial jet prototype took to the air.

The equipment has been studied, and restudied, for a total of hundreds of thousands of man hours. This enormous amount of research has been carried out by the airlines, acting individually and in close co-operation with each other. Not only has the plane itself, and the power plants, been placed under the most detailed scrutiny, the airlines have also examined all of the supporting facilities that will be needed when the planes go into regular service.

Working in close partnership with the military, the airlines have received great assistance due to the wealth of experience that the Air Force has accumulated in jet operations.

The great expansion that lies ahead will provide many benefits for all of the segments of

the airline public: the passenger, the shipper, and the postal user.

But more than that, the greatly increased airlift capability that will be made available with the new equipment will form a strong link in the nation's defense. More and more, military strategists point out, civil air power is becoming an inseparable adjunct to the concept of total air power.

Twenty years ago, a brief time by historians' reckonings, the rules of our industry were set out in the Civil Aeronautics Act. The Act also embraced, in addition to the rules, a philosophy that is even more meaningful today than it was in 1938. It called for the "encouragement and development of an air transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the postal service and of the national defense."

This was an unusual mandate to give a regulatory agency. The ever growing public usefulness of the air transport industry since that time, however, has demonstrated the wisdom of the Act's authors many times over.

By taking the lead in this expansion—a capital program equal to three times their net worth—the airlines are maintaining the great tradition of this dynamic industry. They are carrying out the national policy so clearly set forth by the Congress. Government now must do its part. The real character of the airlines' dramatic advance in technology must be recognized as must the national interest in their success. The wisdom of measures affecting the airlines should be judged against this standard. Facts and Figures for future years will show whether this has been done.

The first twenty years have now been completed. We look forward to the next twenty years, certain that they will contribute an even prouder chapter to aviation history.

Definition of Terms

Passenger Miles and Ton Miles

AVAILABLE SEAT MILES FLOWN. Total seat miles available for sale in scheduled service.

AVAILABLE TON MILES. Total ton miles of lift capacity available for sale in scheduled and charter service.

CHARTER FLIGHT. Transportation of passengers or property on other than scheduled and designated extra section flights.

EXPRESS TON MILE. A ton of express flown one mile.

FREIGHT TON MILE. A ton of freight flown one mile.

PASSENGER MILE. One passenger flown one mile.

PASSENGER LOAD FACTOR. The percentage of available seat miles actually sold in scheduled service.

PASSENGER TON MILES. Passenger miles converted to ton miles. (See definition of revenue ton miles.)

REVENUE PASSENGER MILES. The number of fare paying passengers flown times the length of trip in miles. This is the amount of available seat miles sold.

REVENUE PLANE MILES. Aircraft miles flown in scheduled service.

REVENUE TON MILES. The ton miles sold in scheduled and charter service. In the construction of this traffic measure passenger miles are converted to ton miles on the basis of about 10 to 1. That is, ten passengers with allowable free baggage are accepted as equalling one ton.

SEAT MILE. One passenger seat, filled or unfilled, flown one mile.

TON MILE LOAD FACTOR. Percentage of available ton miles sold in scheduled and charter service.

U. S. MAIL TON MILE. A ton of mail flown one mile. The mail figures are in two categories. These are defined as Priority and Non-Priority. Priority mail includes air mail and air parcel post. Non-priority mail is first class mail that moves in air service. At present non-priority mail is being flown on an experimental basis between certain selected cities.

Revenues and Profit and Loss

EXPRESS REVENUE. Revenues accrued from the carriage of express.

FREIGHT REVENUE. Revenues accrued from the carriage of freight.

INCOME TAXES. Federal income taxes.

NET OPERATING INCOME. The total operating revenue from air transportation services less the operating expenses (see definition of Operating Expenses). Net Operating Income is before taxes and interest charges and does not include non-operating items.

NET PROFIT OR LOSS. Net income after Federal income taxes—the amount available for dividends or investment in the business. This figure is subject to change because of the later adjustment of some accounting transactions and through revision of mail rates and subsidy by regulatory action.

OPERATING EXPENSES. The expenses incurred in the conduct of the business except for such items as debt financing and other non-operating items.

RATE OF RETURN ON INVESTMENT. Total return, i.e. net profit plus interest paid on long term debt, as percent of average investment. Investment is the average of total net worth (stockholders' equity) plus long term debt at the beginning and end of the year.

PROFIT MARGIN ON SALES. Net profit after interest and after taxes as per cent of operating revenues.

OTHER REVENUE. All other revenues, including excess baggage, chartered services, foreign mails, penalties for failure to cancel reservations, service charges on non-revenue transportation of employees and special services such as photography and crop dusting.

PASSENGER REVENUES. Passenger revenues from scheduled operations.

PUBLIC SERVICE REVENUES. Payments by the Federal Government to insure air service to communities in the United States and its territories which could not otherwise afford it; to maintain essential international air routes which are not yet self-supporting; and to develop helicopter service.

U. S. MAIL REVENUE. Service revenue for the transportation of mail. This is the amount paid by the Post Office to purchase air transportation for mail, and is not subsidy.

Air Transport

FACTS AND FIGURES

19th Edition, 1958

The year 1958 marks the 20th Anniversary of U. S. scheduled air transportation under the Civil Aeronautics Act. To show the vast growth of the industry in these two decades, the tables in this issue of Facts and Figures show the first year under the Act, 1938, then the post-war years of 1946, 1948, and 1950, and then six consecutive years through 1957. Revised data filed by the scheduled air carriers with the Civil Aeronautics Board and the records of the Interstate Commerce Commission served as the major sources of the statistics.

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WHAT THE INDUSTRY DID IN 1957

The scheduled airlines set new traffic highs in 1957. They carried more people, and more property, more places and for longer distances than ever before.

1957 was a year in which the airlines flew:

- 49,339,000 passengers,
- 31,243,100,000 revenue passenger miles,
- 160,689,000 ton miles of U. S. mail, and
- 507,678,000 ton miles of freight.

Operating revenues were also at all-time highs. But operating expenses were up at an even higher rate, cutting sharply into the overall net profits of the industry. When the year was over, the airlines found that they had:

- Taken in \$2,116,380,000 in operating revenues,
- Spent \$2,051,339,000 for operating expenses, and
- Kept \$42,477,000 as net profit after taxes and interest.










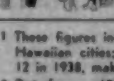
Air Transportation—Still a Bargain Buy

In spite of the relentless upward trend of prices over the last twenty years, the airlines have held the fares to 1938 levels. In that year, for example, the average revenue per passenger mile for the domestic trunklines was 5.32 cents. For twenty years it hovered about that figure until today, including the recently authorized increase of 4 per cent with a \$1.00 service charge per ticket, the average passenger revenue is only 5.42 cents based on carrier estimates for 1958, a gain of 1.9 per cent over 1938.

While air fares have gone up only slightly, service has improved markedly. Flying time between many cities has been cut in half, there is a greater selection of flights, cabin and meal service has improved, and planes are more comfortable, more dependable, and safer.

Decreasing Dependence on Government Aid

Over the last two decades, the scheduled airlines have continually progressed toward self-sufficiency.

20 YEARS OF EVER-INCREASING SERVICE			
All classes of Certified Air Carriers	1938	1957	percent increase
 Number of Airlines	23	53	130
 Cities Served ¹	286	706	147
 Airplanes in Service	345	1,829	430
 Seats Available (Daily)	4,800	94,200	1,863
 Cruising Speed of Fastest Transport	220	360	64
 Number of Passengers Carried	1,306,000	49,619,000	3,699
 Number of People Employed	13,300	138,000 ²	938
 Total Airline Payrolls	\$27,396,000	\$706,000,000 ³	2,477
 Air Mail Ton Miles	7,449,000	160,664,000	2,057
 Average Fare ⁴	5.32	5.25	-1.3

¹ These figures include international cities as well as domestic points and 10 Hawaiian cities; in addition 241 Alaskan points were served in 1957 and 12 in 1938, making a total of 947 cities in 1957 compared to 298 in 1938.

² Data for year 1956.

³ Year ending June 30, 1957.

⁴ Domestic trunk. (Average revenue passenger mile).

In 1938, the airlines received 42.1 per cent of their revenue from the government in the form of mail pay, which included both subsidy and payment for carrying the mail.

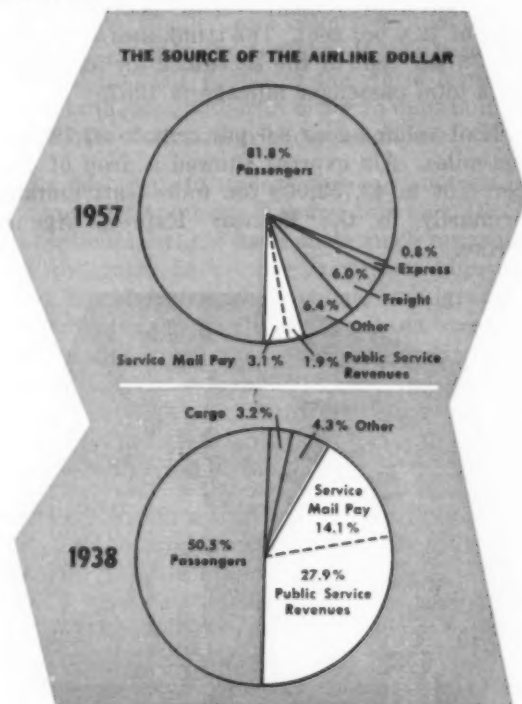
Today, the payments have been separated into service mail pay and public service revenues. Although the airlines have carried increasingly larger amounts of mail, by 1957 their dependency on this revenue had been reduced

to the point where only 3.1 per cent of airline revenues came from mail service.

Subsidy also continues to play a lessening role in airline income. In 1957, only 1.9 per cent of the airlines' total revenues came from the government through these public service revenues.

The last of the domestic trunk lines went off subsidy during 1957. Today, the local service airlines receive the majority of public service revenues, a guarantee that smaller communities will receive the benefits of air transport service.

The other public service revenues are used for the development of helicopter service and for the development and maintenance of national interest routes in Alaska, Hawaii and Latin America.

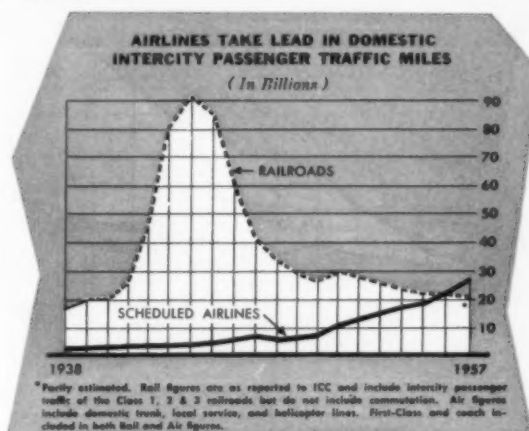


Airlines Now No. 1 Common Carrier

During 1957, the air transport industry took over first place among the common carriers competing for intercity passenger traffic.

Since the mid-1800's when the railroads first assumed the leadership from the barge lines and stage coaches, the Iron Horse had been the leader.

For the year, the airlines flew more than 25 billion passenger miles while the railroads operated approximately 21 billion. The buses, during the period, operated about 16 billion passenger miles.



Airlines Safety Record Outstanding

In 1957, the combined U. S. scheduled domestic and international airlines achieved a safety record almost unparalleled in airline history.

Today, it is more than four times as safe to travel by domestic scheduled airline than by automobile. During 1956, the latest period available, there were 26,100 auto and taxi passenger fatalities, a rate of 2.7 fatalities per 100 million passenger miles.

The airline rate was two-tenths of a passenger fatality per 100 million passenger miles in 1957, as compared with five-tenths of a fatality per 100 million passenger miles in 1956. This record was made during a year when scheduled carriers flew an all-time high of more than 31 billion passenger miles.

Cargo Business At New Peaks

Last year, the air cargo business leaped to new highs with the operation of more than 714,437,000 ton miles of U. S. mail, express and freight, an 8.83 per cent gain over 1956.

The scheduled airlines also achieved new levels of revenues from their cargo business.

DOMESTIC TRUNKLINES

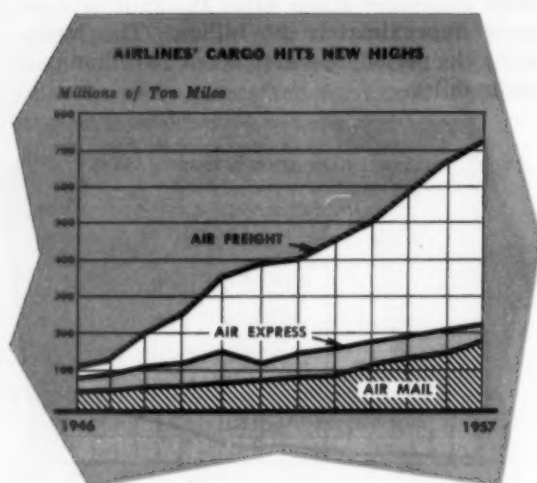
Public service revenues—commonly referred to as subsidy—dropped to zero for the domestic trunkline operations by the end of the year.

At the same time, it was a year when trunkline commitments to purchase pure jet and prop-jet aircraft and related ground equipment reached a figure of about \$2 billion, representing a capital investment of approximately three times the value of present flight property.

As the domestic trunklines geared for the jet age during 1957, traffic continued to rise in all categories except one.

Revenue passenger miles showed an increase of 13.2 per cent, climbing from 21,643,141,000 in 1956 to 24,499,510,000 in 1957. This increase is a slight improvement over the previous year's gain of 12.6 per cent. The trunklines accounted for 78 per cent of the scheduled airline industry's total passenger mileage in 1957.

Mail volume rose 6.0 per cent to 97,194,000 ton-miles. Air express showed a drop of 14.0 per cent to 42,752,000 ton miles—attributable primarily to the Railway Express Agency strike.



Where \$191 million came from the flying of cargo in 1956, more than \$209,211,000 in revenues were realized in 1957, a gain of 9.5 per cent.

U. S. mail ton miles were up 5.38 per cent, freight was up 12.49 per cent, but air express was down 12.57 per cent, due in part to a strike of Railway Express personnel in seven major cities from April to July.

Domestically, air freight rates have become in many cases, comparable with, and in some cases, lower than, the fastest surface transportation rate.

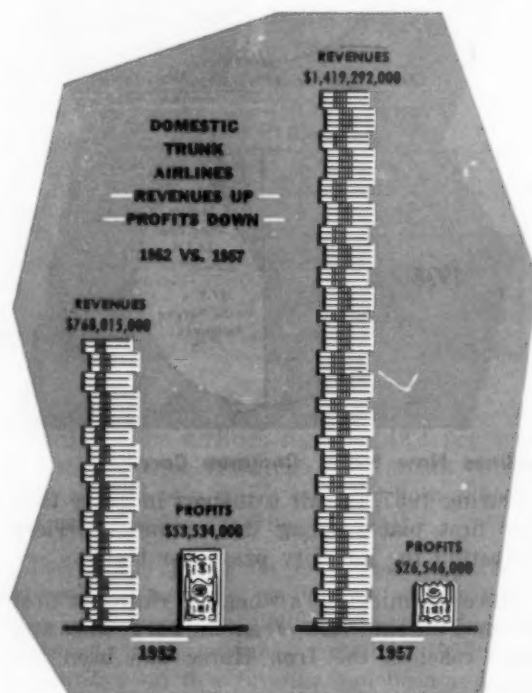
No Show Problem Reduced

With the co-operation of the public, the domestic airlines' program to reduce the number of no shows made notable gains during the year.

The airlines' three-point program was completed last September when a \$3 penalty was initiated. Previously, the industry had instituted a ticket pick-up time-limit provision and a reconfirmation rule.

Surveys conducted during two one-week periods showed that only about one half of one per cent of the industry's passengers were assessed the no show penalty.

The survey also indicated that the number of no shows has been reduced from 14 per cent of passengers boarded to about six per cent.



Meanwhile, air freight volume totaled 218,432,000 ton miles for the year, representing a sharp increase of 14.6 per cent compared to the 9.5 per cent gain recorded in the previous year.

Although the trunklines handled a record volume of passenger and cargo business in 1957, earnings were seriously pinched by a mounting expense level that jumped 18.6 per cent over 1956. Net profit for the industry tumbled from \$57.7 million for 1956 to \$26.5 million in 1957—a drop of 54 per cent.

INTERNATIONAL AIRLINES

There is a critical need for improving our ties with peoples from all parts of the world. In this age of advanced technology the world has become smaller and countries find themselves next door to one another. It thus becomes essential that the people of the world come to understand one another in order to maintain or develop the status of friendly neighbors.

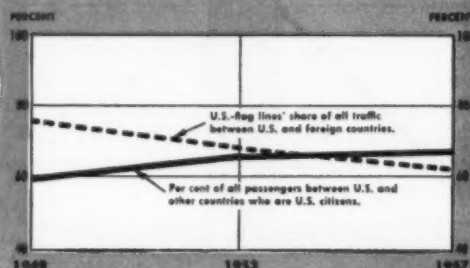
The best way to understand one another is to know one another. Toward this end, U. S. international airlines have made much progress over the years in helping to remove international travel barriers. Customs, immigration and public health facilities have been streamlined in the interest of quick entry into the United States of returning citizens and foreign visitors. The United States now compares favorably with respect to border-crossing formalities with most of the nations of the world.

These efforts are reflected in the increasing volume of international airline traffic. During 1957, U. S. international carriers flew 5,751,669,000 revenue passenger miles, as compared with 5,113,212,000 during the previous year. Cargo ton miles reached a new high of 123,280,000—an increase of 12.9 per cent over 1956, while mail ton miles jumped from 55,156,000 in 1956 to 57,265,000 ton miles in 1957.

The year was marked, however, by the unjustified grant of valuable air routes to foreign flag competitors—KLM and QANTAS—without exacting in return rights for U.S.-flag airlines of comparable economic value. These grants were contrary to the spirit of the United States' bi-partisan air transport policy.

FOREIGN AIRLINES TAKING BIGGER SHARE OF U.S. MARKET

As foreign airlines are given more U.S. routes, the U.S.-flag lines' share of the market declines despite over increasing number of U.S. citizens flying between U.S. and other countries. Since 1949, the number of foreign airlines sharing the U.S. market has risen from 22 to 29. In addition, many of these carriers have been awarded additional routes in the U.S. market.



LOCAL SERVICE AIRLINES

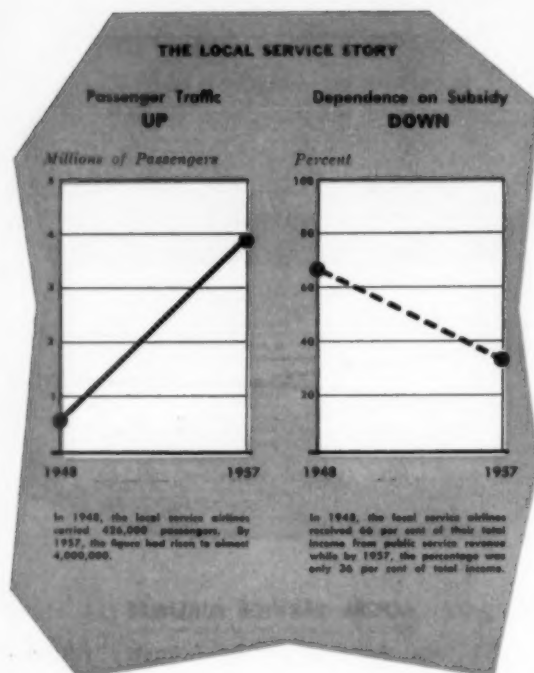
The local service airline industry rounded out its twelfth full year of operations in 1957 by carrying 3,949,000 revenue passengers, for a 12-year total of 20,305,000.

Created directly after World War II to link the intermediate cities of the nation with one another and with metropolitan centers, the local airline industry carried only 25,000 passengers in 1946, first full year of service.

Pursuing a program of constantly increasing public usefulness, the 13 local service carriers today operate a fleet of 225 transports over a system that measures 24,425 unduplicated route miles and reaches into all but four of the 48 states.

It is particularly significant that more than one half of all the cities served by the local airlines would have no direct scheduled airline passenger, mail or cargo service if it were not for the local carriers.

In the past 10 years the local airline industry has increased its passenger load factor from 27 per cent to 45 per cent and has increased passenger revenues ten-fold and total operating revenues five-fold. Accordingly, the percentage of public service revenues has declined—from 66 per cent of the industry's total income down to 36 per cent. Since 1952 the industry has increased its traffic over 100 per cent.



In 1957 Congress passed two bills designed to encourage airlines to re-equip. One guarantees loans that the local airlines and certain other carriers may secure for purchase of improved flight equipment and the other makes certain equipment trust provisions applicable to aircraft and aircraft equipment. Also, a bill was proposed which would permit local service carriers to apply the capital gains from the sale of obsolete aircraft to the purchase of more modern planes instead of having the proceeds deducted from their public service revenues.

HELICOPTER CARRIERS

One-hundred and forty-five per cent more passengers flew scheduled helicopter in 1957 than in 1956, testifying to the growing popularity and usefulness of scheduled helicopter service.

Serving greater Los Angeles, Chicago and New York, the helicopter airways carried 152,000 revenue passengers in 1957, compared to only 62,000 in 1956. Revenue passenger-miles totaled 3,273,000 in 1957, an increase of 106 per cent.

Largely through the introduction of additional and larger rotorcraft during the year, the helicopter airlines provided, in terms of

seat-miles available, 126 per cent more service than in 1956.

Air freight tonnage spiraled in 1957—a gain of 100 per cent to 14,000 ton miles. Air express tonnage increased at a faster rate than during the preceding year: 35,000 ton miles in 1957 for an increase of 13 per cent. The helicopter airlines flew 91,000 ton miles of mail, a gain of two per cent.

The three helicopter lines altogether operate 26 aircraft over 545 route miles serving 24 certificated points.

THE ALASKAN CARRIERS

In 1957 permanent certification for carriers operating between points in the United States and Alaska was authorized, permitting these airlines the same permanent operating rights that were authorized in 1956 for carriers operating within Alaska.

During 1957 the Alaskan carriers improved their scheduled traffic figures in the movement of passengers and mail, but showed a drop in cargo.

Revenue passenger miles went up 10.9 per cent to a 1957 figure of 151,886,000. U. S. mail ton miles went up from 2,383,000 to 2,702,000, a gain of 13.4 per cent. Cargo ton miles dropped 9.3 per cent with a haul of 7,208,000 compared to 1956 when 7,948,000 ton miles were flown.

Revenue ton miles showed a drop of 26.6 per cent with a 1957 total of 32,900,000 compared to 44,800,000 the year before. The fall-off was due largely to a reduction in the number of military charters, more than offsetting the gains in scheduled service.

TERRITORIAL CARRIERS

Last year the territorial lines achieved a gain in revenue passenger miles of 6.7 per cent over 1956 with 89,500,000 as compared to 83,900,000. U. S. mail ton miles increased slightly from 65,000 to 66,000.

In the freight-carrying field, the territorial lines increased ton-mile carriage from 1,475,000 in 1956 to 1,536,000 last year—a gain of 4.1 per cent.

Overall, the revenue ton miles of the territorial carriers went up 5.5 per cent, from 8,503,000 to 8,968,000.

THE ALL-CARGO LINES

The all-cargo airlines registered impressive gains in all categories last year. Their overall ton-mile haul was up 35.4 per cent over 1956, rising from 248,781,000 to 336,862,000.

Most spectacular increase was in air express which increased 29.4 per cent—from 1,266,000 ton miles in 1956 to 1,638,000 in 1957.

U. S. mail ton miles increased from 1,569,000 to 1,849,000—up 17.8 per cent while freight ton miles went up 10.5 per cent—from 140,420,000 to 155,126,000.

IMPROVING SERVICE TO POSTAL USERS

The year 1958 will see three anniversaries marked—all significant milestones in the history of air mail service and the story of its growth and usefulness to the postal service and the public.

They are: The 40th Anniversary of Air Mail, the 20th Anniversary of the Civil Aeronautics Act, and the 10th Anniversary of Air Parcel Post.

Air mail came into being on May 15, 1918 when World War I Army pilots flew mail between Washington, Philadelphia and New York. During that first year of air mail operations about 96 tons of mail were carried to produce \$159,700 in "aeroplane" postage revenue. Today, air mail produces some \$180 million annually in revenue for the Post Office Department.

On June 23, 1938 the Civil Aeronautics Act was passed which placed an obligation on the scheduled airlines to serve the postal system of the United States. Since then, public use of air mail has increased more than a thousand fold.

At least two other additions to mail movements by air have added to the usefulness and versatility of air mail. On September 1, 1948, parcel post gained wings and in September of 1953 the Post Office began what is known as the "Three-Cent Air Mail Experiment" under which domestic airlines carry first-class letters daily between certain cities on a space available basis.

When the airlines first began to carry the mail and fulfill their obligations under the Civil

Aeronautics Act, public service revenues were an important source of income for the young industry. In 1938, 94.5 per cent of stamp revenues went to the airlines while the Post Office kept 5.5 per cent. Today, airlines receive only about 15 per cent and the remainder goes to the Post Office. "We save money every time we use air," the Postmaster General said recently.

Increasing usefulness of air mail is reflected in air transport industry figures for 1957. A total of 143,794,000 ton miles of letters, cards and parcel post were flown—an increase of 4.9 per cent over 1956. Parcel post—lusty young



member of the air mail family, is growing steadily. Air parcel post shipments increased by 83.6 per cent over a six year period.

Three-cent mail carried by air increased, too. During 1957 this mail totaled 16,895,000 ton miles, up over 1956 by 9.53 per cent. This service benefits the public by making mail deliveries possible 12 to 48 hours sooner than if it had moved by surface, and a Post Office spokesman has said that studies of the experiment showed "that costs were not greater, in fact, they were running a bit less than when we were using surface transportation."

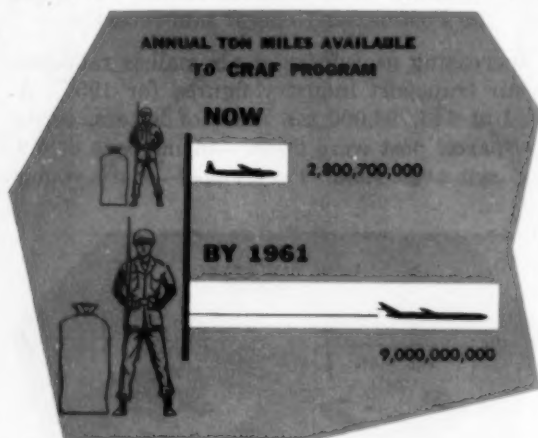
NATIONAL DEFENSE

While the airlines are dedicated to the public service, to the nation's commerce and postal service, they are dedicated also to the national defense.

As part of defense planning, the airlines—in cooperation with the Department of Defense and other government agencies—have established the Civil Reserve Air Fleet (CRAF) and

the War Air Service Pattern (WASP) for maximum domestic and global military airlift in time of national emergency.

The CRAF—composed of 368 long-range four-engine airliners, including 314 from the scheduled airline fleets—would operate on a



global basis, carrying troops, supplies and equipment in support of the military effort. All remaining four- and twin-engine aircraft in the civil fleets would make up the WASP to provide an intensive system of priority airlift in support of defense production at home.

The machinery has been set up whereby the airlines can swing all or part of their operation into military service immediately should an emergency arise and be fully operational within 48 hours.

The advent of the jet age promises even greater benefits to the national security. Most of the turbine-powered aircraft on order are the types most desirable for wartime military support operations. When delivered, the civil capability under wartime conditions will be more than 9 billion ton miles annually, compared to the 2.8 billion of the present piston CRAF. The airlift capacity will be nearly 15 times more than the average annual airlift provided by the airlines during World War II in military and civilian service.

During 1957, the Air Force emphasized that it will depend upon the scheduled airlines for normal jet air transport lift in time of emergency. Secretary of the Air Force James H. Douglas said: "We have not ordered any turbo-jet transport aircraft for the Military Air

Transport Service such as the airlines have on order in large number and which we count on the airlines making a part of the Civil Reserve Air Fleet."

In an unusual move, the Defense Department intervened in the General Passenger Fare Investigation hearings last year. The Department stated that "it recognizes as a matter of the greatest urgency the necessity for maintaining a strong, modern and economically sound air carrier industry to meet the requirements of national defense during peace time and national emergencies."

The airline defense role represents substantial saving to the American taxpayers. It would cost the government an estimated \$550 million initially just to acquire the present piston CRAF, plus \$350 million annually to maintain its readiness. Since most of the aircraft on order will be suitable for military airlift, most of the \$2.5 billion investment being made by the airlines constitutes further substantial saving to the taxpayers.

Airlines as Military Partners

This unique capability of the airlines stands out as one of America's finest examples of military-industry partnership—a close, working relationship that serves the nation in peacetime as well as in time of emergency.

Every hour of every day the scheduled airlines serve the Department of Defense through the Military Bureau of the Air Transport Association and its field offices. To better serve the various branches of the armed forces, the scheduled airlines have established Joint Airline Military Traffic Offices (JAMTO's) at 68 military installations throughout the country. Under the jurisdiction of local military committees of the industry, these JAMTO's assist in making arrangements for movement of both cargo and personnel.

It is estimated that some 22 million man hours were saved during fiscal 1957 by the use of scheduled air transportation.

AIR NAVIGATION AND TRAFFIC CONTROL

One of the pressing needs for the orderly growth of civil aviation is a modern navigation and traffic control system. Such a system does

not now exist but the government is encouraging its development.

A positive step toward this end was taken in May when the Special Assistant to the President for Aviation Facilities Planning, General Edward P. Curtis, made his report.

The report called for the setting up of the Airways Modernization Board, an independent agency "responsible for developing and consolidating the requirements for future systems which are needed to provide the necessary communications, navigational aids, and control needed to accommodate the future air traffic in the United States. It would be responsible as well for the systems engineering, the evaluation, and the selection of such aids as will best serve the needs of aviation."

It is clear that a revamped system will require considerable expenditure. The scheduled airline industry believes that the principle of payments for the use of such federally furnished facilities within the U. S. is a sound one. The airlines have been paying a fair share of the cost and they expect to do so in the future.

Increase in Fuel Tax Proposed

Any allocation of costs that is made, however, must take into consideration the degree to which the airways are used by the three components of aviation: military, air transport, and private and business flying. At year's end, the air transport industry was operating 1,829 planes, the military 40,000 and private and business interests, 60,000 planes.

Before assessing a higher fuel tax, as the government recently proposed, there should be a thorough study which will determine the actual use of the airways. According to the Administrator of the Civil Aeronautics Administration, the military makes use of the airways system 45 per cent of the time. Since the military also has an overriding, and understandable, priority call on the exclusive use of the airways, this fact should also be taken into account.

The vanishing air space remained a critical problem at year's end. As the Curtis report pointed out, "The American airspace is a natural resource that is on the verge of exhaustion in terms of the capacity of the system now in

place for managing our free and safe access to this resource."

A start on the problem was made when the Civil Aeronautics Board delegated to the Civil Aeronautics Administrator final authority in the designation of restricted areas.

Prior to this action, the air space had been controlled by the Administrator with the assistance of the Air Space Panel of the Air Coordinating Committee. Because unanimous consent of the panel members was needed however, some of the compromises that resulted were in conflict with the public interest, the Board noted.

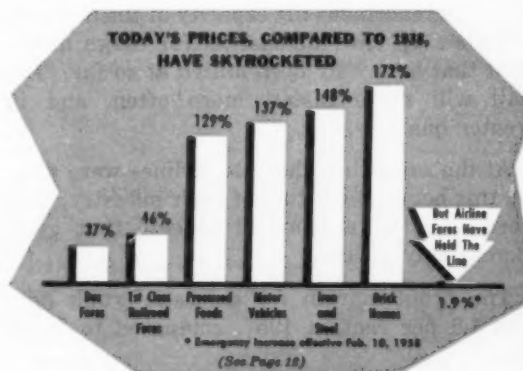
The airlines strongly support the new procedure and are in accord with the Civil Aeronautics Board's position that it is a "major forward step in determining how air space will be used," and that it "will resolve the conflicts that arise between the various users of air space."

Airport Rentals and Landing Fees

For the last ten years, the airlines have been paying steadily increasing landing fees to airports. At one large city, they have gone up in that period from 4.4 cents to 16 cents per 1,000 pounds; at a medium size city, from 3.3 cents to 8.8 cents, and at a smaller city, from 3.3 cents to 9.4 cents.

In 1957, the domestic trunk and local service airlines paid out an estimated \$14 million in landing charges.

To this figure must be added an estimated \$10 million representing rental payments made by the airlines during 1957. This total of \$24 million paid to airports is just about equal to



the net profit of the domestic industry for the year.

JET PROGRAM THREATENED BY FINANCIAL SQUEEZE

At the end of the year, the scheduled airlines had on order 474 new aircraft for delivery between 1958 and 1961.

Making up the airline order were 230 pure jet planes, 167 turbo-props, 70 piston aircraft and seven helicopters.

The equipment orders represent an investment of more than \$2.5 billion. This investment became all the more important when the end of 1957 saw the beginning of a recession that forced many industries to cut back on capital expenditures.

The airlines' re-equipment program will go a long way toward the priming of the pump of American industry, providing new jobs, creating new skills, and spreading its revitalizing energy throughout the whole economy.

Airline estimates indicate that 30 per cent of all traffic will be flying in turbine-powered aircraft by the end of 1959 and that the new jets will be the basic airline aircraft by 1961. The Civil Aeronautics Administration predicts that by 1965, domestic volume will reach 93 million passengers, almost twice the amount carried in 1957.

With the introduction of the jets, the public will be able to fly faster and more comfortably than ever before. The world will be shrunk to a little more than half its present size and time will be reckoned not in hours, but in minutes.

Shippers will see their goods being moved across the country and over oceans in half the time. The enormous lift capacity of the new jets will open up new dimensions for cargo movement that have only been hinted at so far. The mail will move faster, more often, and in greater quantity.

At the same time that the airlines were placing this bet on the future of their industry, they were beset by a financial squeeze that grew increasingly severe.

The profit margin for domestic trunk lines was 1.9 per cent in 1957, compared to 7 per

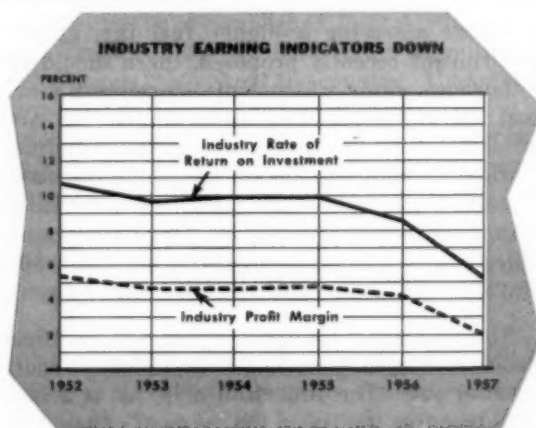
cent in 1952. The operating profit margin was 5.4 cents per available ton mile for 1951 but it had dipped to .8 cents by 1957. Operating margin per revenue ton-mile was 8.9 cents for 1951, compared to 1.5 cents for last year.

Since 1938, the average revenue per passenger mile has gone down from 5.32 cents to 5.25. During that same time, the overall cost of living went up 98 per cent, bus tickets went up 37 per cent and rail freight rates went up 46 per cent.

Despite the fact that virtually every trunk airline filed requests for fare increases ranging from 12 to 17 per cent, the Civil Aeronautics Board granted, in early 1958, only a 4 per cent increase with a \$1 service charge per ticket.

The inadequacy of the increase can be seen in the comparison of profit margins over recent years. Last year, as noted, the profit margin was 1.9. With the recent increase, it is estimated that the profit margin for 1958 will be only 2.61, a long way down from the 4.6 per cent of 1956, or the 7 per cent of 1952. The estimated gross revenues for 1958 will more than double those of 1952, but the profit margin will be a good deal less than half.

The earnings decline has affected not only the domestic trunk lines, but the entire industry as well. The rate of return on investment for the scheduled airlines dipped from 10.9 per cent in 1952 to a low of 5.1 for 1957. Industry profit margins fell off similarly, going from 5.3 per cent in 1952 to a dangerously low level of 2.0 per cent for 1957.



AVAILABLE SERVICE AND UTILIZATION

U. S. Scheduled Airline Industry

(For Selected Years, In Millions)

THIS TABLE SHOWS THE EVER INCREASING GROWTH IN THE SERVICES THE SCHEDULED AIRLINES ARE OFFERING TO THE PUBLIC AND THE INCREASING USE OF THIS SERVICE BY THE PEOPLE, THE GOVERNMENT AND SHIPPERS.

LOAD FACTOR IS THE PERCENTAGE OF CAPACITY WHICH IS SOLD.

	Available Ton Miles Flown	Revenue Ton Miles Flown	Ton Mile Load Factor (%)	Available Seat Miles Flown	Revenue Passenger Miles Flown	Passenger Load Factor (%)	Revenue Plane Miles Flown
Domestic Trunk Airlines							
1938.....	N.A.	53.5	.....	908.4	457.3	50.35	65.4
1946.....	982.2	637.9	64.95	7,490.4	5,903.1	78.81	304.5
1948.....	1,357.9	700.7	51.60	9,980.2	5,822.4	58.34	316.3
1950.....	1,684.1	953.5	56.62	12,385.6	7,766.0	62.70	327.1
1952.....	2,399.3	1,397.4	58.24	18,068.1	12,120.8	67.08	411.4
1953.....	2,893.4	1,624.9	56.16	22,114.8	14,297.6	64.65	467.0
1954.....	3,314.1	1,832.6	55.30	25,646.5	16,246.3	63.35	497.2
1955.....	3,882.7	2,160.1	55.63	30,001.3	19,217.2	64.05	564.0
1956.....	4,393.2	2,417.0	55.02	33,752.6	21,643.1	64.12	622.1
1957.....	5,150.4	2,720.0	52.81	39,838.2	24,499.5	61.50	711.1
Local Service Airlines							
1938 ¹.....	.....	.....	.....	.....	.....	.....	.....
1946.....	1.8	.7	41.71	18.0	6.8	37.92	3.0
1948.....	31.5	9.3	29.46	323.9	87.9	27.14	18.0
1950.....	62.4	20.6	33.02	599.2	188.8	31.51	33.0
1952.....	96.2	36.0	37.37	905.4	339.2	37.46	41.1
1953.....	109.3	41.1	37.61	1,013.6	390.9	38.56	45.6
1954.....	112.9	47.5	42.04	1,069.7	449.5	42.02	47.7
1955.....	121.9	55.3	45.36	1,161.4	523.3	45.06	50.9
1956.....	145.6	66.8	45.91	1,385.0	633.2	45.72	59.5
1957.....	170.7	78.4	45.95	1,653.8	747.3	45.19	67.3
Territorial Airlines							
1938.....	N.A.	.4	.....	6.7	4.2	63.07	.6
1946.....	6.1	3.7	60.59	48.1	38.0	79.04	2.3
1948.....	9.1	5.1	56.24	81.0	52.9	65.28	3.6
1950.....	10.9	5.7	52.20	100.1	57.7	57.66	4.3
1952.....	14.2	7.1	50.03	124.1	67.9	54.72	5.4
1953.....	15.9	7.4	46.34	134.6	71.8	53.37	4.9
1954.....	15.7	7.6	48.46	134.5	72.7	54.04	4.7
1955.....	16.1	8.4	52.10	134.7	78.1	57.99	4.6
1956.....	16.0	8.5	53.03	147.9	83.9	56.70	4.6
1957.....	15.9	9.0	56.31	154.9	89.5	57.78	4.7
Helicopter Airlines (in thousands)							
1938 ¹.....	.....	.....	.....	.....	.....	.....	.....
1946 ¹.....	.....	.....	.....	.....	.....	.....	.....
1948.....	108	28	25.93	.....	.....	.....	284
1950.....	189	63	33.33	.....	.....	.....	668
1952.....	181	75	41.44	.....	.....	.....	631
1953.....	350	129	36.86	191	26	13.61	1,006
1954.....	388	152	39.18	716	183	25.56	1,071
1955.....	434	195	44.93	1,708	628	36.77	1,148
1956.....	567	277	49.03	3,561	1,588	44.59	1,315
1957.....	1,056	450	42.61	8,049	3,273	40.66	1,604

See Footnotes at Bottom of Page 14

**Available Service
and Utilization**
(continued)

	Available Ton Miles Flown	Revenue Ton Miles Flown	Ton Mile Load Factor (%)	Available Seat Miles Flown	Revenue Passenger Miles Flown	Passenger Load Factor (%)	Revenue Plane Miles Flown
International and Overseas Airlines							
1938.....	-----	57.2 ¹	-----	116.1	53.2	45.83	7.0
1946.....	211.7	145.1	68.55	1,553.7	1,100.7	70.85	59.4
1948.....	480.8	282.2	58.69	3,292.3	1,888.9	57.37	98.1
1950.....	554.2	334.5	60.35	3,695.4	2,206.4	59.71	93.8
1952.....	693.7	434.2	62.59	4,848.8	3,019.8	62.28	103.4
1953.....	760.5	474.4	62.38	5,462.2	3,381.1	61.90	109.6
1954.....	856.1	534.2	62.40	6,284.9	3,743.3	59.56	116.1
1955.....	984.6	633.8	64.37	7,012.1	4,410.8	62.90	130.7
1956.....	1,143.4	741.2	64.82	8,073.1	5,113.2	63.34	146.0
1957.....	1,292.9	854.7	66.10	9,038.1	5,751.7	63.64	155.7
Alaskan Airlines							
1938 ¹	-----	-----	-----	-----	-----	-----	-----
1946 ¹	-----	-----	-----	-----	-----	-----	-----
1948.....	20.1	13.0	64.37	42.6	19.6	46.10	4.6
1950.....	19.7	10.2	51.79	54.0	22.4	41.60	5.4
1952.....	26.7	14.6	54.51	168.8	71.2	42.16	9.3
1953.....	34.1	19.6	57.49	209.2	92.4	44.15	10.4
1954.....	34.4	19.6	56.91	206.3	87.0	42.15	9.6
1955.....	46.0	29.4	63.87	233.9	110.4	47.20	10.5
1956.....	66.9	44.8	66.98	284.1	137.0	48.21	11.3
1957.....	59.0	32.9	55.68	329.7	151.9	46.07	11.5
All Cargo Airlines							
1938 ¹	-----	-----	-----	-----	-----	-----	-----
1946 ¹	-----	-----	-----	-----	-----	-----	-----
1948 ¹	-----	-----	-----	-----	-----	-----	-----
1950.....	80.2	59.5	74.20	-----	-----	-----	13.0
1952.....	118.6	97.0	81.82	-----	-----	-----	17.8
1953.....	121.9	99.3	81.51	-----	-----	-----	17.6
1954.....	108.8	88.6	81.48	-----	-----	-----	12.6
1955.....	104.0	135.1	73.41	-----	-----	-----	17.1
1956.....	321.5	248.8	77.38	-----	-----	-----	23.5
1957.....	431.7	336.9	78.04	-----	-----	-----	23.3
CONSOLIDATED INDUSTRY							
1938.....	-----	111.1 ²	-----	1,031.2	514.8	49.92	73.0
1946.....	1,201.7	787.4	65.53	9,110.2	7,048.7	77.37	369.3
1948.....	1,899.4	1,010.2	53.18	13,720.0	7,871.7	57.38	440.9
1950.....	2,411.7	1,384.1	57.39	16,834.3	10,241.4	60.84	477.2
1952.....	3,349.0	1,986.3	59.31	24,115.2	15,618.9	64.77	589.1
1953.....	3,935.3	2,266.8	57.60	28,934.5	18,233.8	63.02	656.1
1954.....	4,442.5	2,530.3	56.96	33,342.7	20,599.0	61.78	688.9
1955.....	5,235.7	3,022.2	57.72	38,545.1	24,340.4	63.15	779.0
1956.....	6,087.1	3,527.4	57.95	43,646.3	27,612.0	63.26	868.4
1957.....	7,121.7	4,032.3	56.62	51,022.6	31,243.1	61.23	975.3

¹ Data not available for Alaskan airlines in 1938 and 1946. Local Service operations initiated in 1945. Helicopter operations started in 1947, passenger service began in 1953. All Cargo Airlines began operations in fourth quarter of 1949.

N.A. Not available.

² Revenue Ton Mile data for items other than passenger ton miles for International and Overseas carriers not available for 1938, hence total does not reflect these items.

Note: Available Ton Miles and Revenue Ton Miles includes charter operations; all other items are for scheduled service only.

REVENUE TON MILES OF TRAFFIC CARRIED

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Revenue Ton-Miles)

THIS TABLE SHOWS, BY CATEGORIES, THE EVER INCREASING USE OF THE SCHEDULED AIRLINES BY PASSENGERS AND COMMERCE

	Passenger ^a	Priority U. S. Mail	Non Priority ^a U. S. Mail	Express	Freight	Charter Flights	Excess Baggage	Total
Domestic Trunklines								
1938	43,447	7,446	-----	-----	2,089 ^a	n.a.	473	53,455
1946	560,796	32,878	-----	23,652	14,433	n.a.	6,128	637,887
1948	553,127	37,510	-----	29,769	70,438	3,158	6,657	700,659
1950	737,771	46,315	-----	36,538	112,861	8,203	11,782	953,470
1952	1,151,475	68,296	-----	40,375	117,128	8,593	11,512	1,397,379
1953	1,358,270	69,936	1,789	42,514	131,778	6,874	13,706	1,624,867
1954	1,543,399	69,098	11,103	40,122	144,276	8,317	16,288	1,832,603
1955	1,825,631	71,859	14,175	49,603	174,017	5,737	19,046	2,160,068
1956	2,056,098	77,788	13,891	49,709	190,592	5,911	23,055	2,417,044
1957	2,327,334	82,057	15,137	42,752	218,432	6,335	27,983	2,720,030
Local Service Airlines								
1938 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1946	647	60	-----	24	-----	n.a.	4	735
1948	8,353	334	-----	190	265	90	39	9,271
1950	17,934	566	-----	623	696	653	118	20,590
1952	32,223	912	-----	894	1,116	653	168	35,966
1953	37,131	951	49	954	1,179	649	198	41,111
1954	42,703	976	250	1,043	1,158	1,108	224	47,462
1955	49,713	928	328	1,403	1,355	1,338	245	55,310
1956	60,156	1,192	344	1,687	1,624	1,520	320	66,843
1957	70,990	1,174	348	1,645	2,082	1,719	471	78,429
Territorial Airlines								
1938	403	3	-----	-----	9 ^a	n.a.	3	418
1946	3,043	34	-----	112	389	n.a.	98	3,676
1948	4,229	53	-----	134	581	39	68	5,104
1950	4,620	65	-----	119	529	304	56	5,693
1952	5,431	50	-----	55	1,258	272	49	7,115
1953	5,748	57	-----	n.a.	1,503	27	46	7,381
1954	5,817	58	-----	n.a.	1,657	45	34	7,611
1955	6,250	59	-----	n.a.	1,646	436	20	8,411
1956	6,710	63	2	-----	1,475	236	17	8,503
1957	7,159	65	1	-----	1,536	170	37	8,968
Helicopter Airlines								
1938 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1946 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1948	-----	28	-----	-----	-----	-----	-----	28
1950	-----	63	-----	-----	-----	-----	-----	63
1952	-----	75	-----	-----	-----	-----	-----	75
1953	2	123	-----	-----	2	-----	2	129
1954	17	115	-----	13	5	-----	2	152
1955	60	96	-----	31	5	-----	3	195
1956	149	89	-----	31	7	-----	1	277
1957	309	91	-----	35	14	-----	1	450

See Footnotes at Bottom of Page 16

**Revenue Ton Miles of
Traffic Carried**
(continued)

	Passenger ^a	Priority U. S. Mail	Non Priority ^a U. S. Mail	Express	Freight	Charter Flights	Excess Baggage	Total
International and Overseas Airlines^a								
1938	57,199	n.a.	-----	n.a.	n.a.	n.a.	n.a.	57,199
1946	118,330	6,141	-----	15,090	n.a.	n.a.	5,557	145,118
1948	203,062	17,203	-----	41,581	4,012	7,990	8,314	282,162
1950	237,188	21,188	-----	44,513	16,050	5,730	9,825	334,494
1952	318,608	22,068	-----	281	72,346	7,846	13,051	434,200
1953	352,963	24,466	-----	219	74,427	7,700	14,583	474,358
1954	386,868	35,323	-----	217	81,886	13,790	16,136	534,220
1955	453,195	52,409	-----	243	90,598	19,701	17,648	633,794
1956	524,369	55,158	-----	-----	109,235	32,652	19,757	741,171
1957	589,510	57,265	-----	-----	123,280	63,833	20,771	854,659

Alaskan Airlines^a

1938 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1946 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1948	2,109	281	-----	-----	1,027	9,509	40	12,966
1950	2,413	741	-----	-----	882	6,095	90	10,221
1952	7,654	1,591	-----	-----	4,252	955	99	14,551
1953	9,928	1,987	-----	-----	5,908	1,640	114	19,577
1954	9,350	2,058	-----	-----	5,998	2,086	114	19,606
1955	11,868	2,279	-----	-----	7,300	7,773	152	29,372
1956	14,719	2,383	-----	-----	7,948	19,527	241	44,818
1957	16,328	2,702	-----	-----	7,208	6,348	279	32,865

All Cargo Airlines

1938 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1946 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1948 ¹	-----	-----	-----	-----	-----	-----	-----	-----
1950	-----	-----	-----	-----	58,420	1,125	-----	59,545
1952	-----	-----	-----	-----	92,367	4,670	-----	97,037
1953	-----	-----	-----	-----	88,812	10,517	-----	99,329
1954	-----	-----	-----	-----	76,653	11,988	-----	88,641
1955	-----	-----	318	-----	107,945	26,796	-----	135,059
1956	-----	381	1,188	1,266	140,420	105,526	-----	248,781
1957	-----	440	1,409	1,638	155,126	178,249	-----	336,862

CONSOLIDATED INDUSTRY^a

1938 ¹	101,049	7,449	-----	-----	2,098 ²	-----	476	111,072
1946 ¹	682,816	39,113	-----	38,878	14,822	-----	11,787	787,416
1948 ¹	770,880	55,409	-----	71,674	76,323	20,786	15,118	1,010,190
1950	999,926	68,938	-----	81,793	189,438	22,110	21,871	1,384,076
1952	1,515,391	92,992	-----	41,605	288,467	22,989	24,879	1,986,323
1953	1,764,042	97,520	1,838	43,687	303,609	27,407	28,649	2,266,752
1954	1,988,154	107,628	11,353	41,395	311,633	37,334	32,798	2,530,295
1955	2,346,717	127,630	14,821	51,280	382,866	61,781	37,114	3,022,209
1956	2,662,201	137,054	15,425	52,693	451,301	165,372	43,391	3,527,437
1957	3,011,630	143,794	16,895	46,070	507,678	256,654	49,542	4,032,263

N.A. Not available.

¹ Data not available for Alaskan airlines in 1938 and 1946. All Cargo airlines began operations in fourth quarter of 1949.

Local Service operations initiated in 1945.

Helicopter operations started in 1947.

Express and Freight combined.

Revenue Ton Mile data for items other than passenger ton miles for International and Overseas carriers not available for 1938, hence total does not reflect these items.

^a Foreign mail carried by International and Overseas airlines is included in Excess Baggage. Therefore, it is also reflected in Consolidated Industry Excess Baggage data.

Express and Freight figures of Alaskan carriers are combined, and thus reflected in Consolidated Industry freight figures.

^b See definitions, p. 3.

^c Passenger ton miles were revised to conform with "standard" passenger weights as prescribed by the CAB effective Jan. 1, 1957.

OPERATING REVENUES

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS THE DOLLARS OF SALES THE SCHEDULED
AIRLINES EARNED FOR THE VARIOUS SERVICES THEY RENDER

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 ^P
Domestic Trunk Airlines										
Passenger	\$ 24,336	272,573	334,736	430,098	671,257	775,782	872,834	1,021,855	1,142,197	1,286,722
U. S. Mail										
Priority	\$ 15,751	20,274	47,838	46,311	35,910	32,955	31,137	24,230	28,937	30,916
Non-Priority	\$					342	2,096	2,708	2,654	2,855
Public Service Revenue ³	\$					3,156	4,081	3,192	2,609	1,127
Express	\$	9,185	9,964	12,569	15,853	16,829	15,107	19,405	18,101	14,667
Freight	\$ 1,261 ²	4,085	13,825	21,698	25,529	29,341	33,009	39,605	42,173	49,911
Other	\$ 903	5,776	6,990	13,433	19,466	20,388	19,954	22,353	26,160	33,094
Total	\$ 42,251	311,893	413,353	524,109	768,015	870,793	978,218	1,133,348	1,262,831	1,419,292
Local Service Airlines¹										
Passenger	\$	315	4,667	10,303	19,766	23,306	27,673	32,840	40,166	47,464
U. S. Mail										
Priority	\$	1,559	10,911	16,581	21,177	1,223	1,178	1,084	1,004	1,108
Non-Priority	\$					16	77	101	102	103
Public Service Revenue ³	\$					23,117	23,639	20,923	23,211	29,560
Express	\$	13	72	230	417	463	496	665	775	725
Freight	\$	N.A.	76	212	405	462	502	556	750	1,061
Other	\$	44	195	544	614	771	1,150	1,281	1,704	1,997
Total	\$	1,931	15,921	27,870	42,379	49,358	54,715	57,450	67,712	82,018
Territorial Airlines										
Passenger	\$ 525	2,706	3,888	4,105	4,433	4,771	5,270	5,686	6,042	6,938
U. S. Mail										
Priority	\$ 47	122	189	285	768	46	46	48	51	52
Non-Priority	\$								1	
Public Service Revenue ³	\$					1,082	594	291	288	72
Express	\$	112	134	125	63	N.A.	N.A.			
Freight	\$ 17 ²	225	302	288	562	692	732	752	782	771
Other	\$ 5	216	137	410	420	135	148	337	266	481
Total	\$ 594	3,381	4,650	5,213	6,246	6,726	6,790	7,114	7,430	8,314
Helicopter Airlines¹										
Passenger	\$					10	63	208	438	968
U. S. Mail										
Priority	\$		372	791	1,033	1,892	296	250	234	237
Non-Priority	\$					655	2,582	2,710	2,833	3,567
Public Service Revenue ³	\$						35	100	115	101
Express	\$									
Freight	\$					4	16	23	28	36
Other	\$			7	13	44	78	64	63	123
Total	\$		372	798	1,046	2,605	3,070	3,355	3,711	5,032

See Footnotes at Bottom of Page 18

Operating Revenues (continued)

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 P
International and Overseas Airlines										
Passenger	\$ 4,435	91,417	151,338	160,673	212,458	232,539	254,234	294,828	342,553	377,563
U. S. Mail (Priority).....	\$ 8,599	25,061	57,332	55,689	51,533	18,037	20,681	25,639	26,926	28,353
Public Service Revenue ¹.....	\$ .....	.....	.....	.....	.....	35,709	28,511	1,583	8,308	568
Express	\$	11,413	19,438	15,783	87	74	70	77	82	80
Freight	\$ 562 ²	N.A.	1,370	5,881	26,730	27,257	29,614	31,853	36,683	41,434
Other	\$ 1,557	18,863	19,756	22,105	24,110	23,670	25,739	30,324	38,113	39,824
Total	\$ 15,153	146,754	249,234	260,131	314,918	337,286	358,849	384,304	452,665	487,822

Alaskan Airlines¹

Passenger .....	\$ .....	.....	2,492	2,758	5,857	6,815	6,479	8,162	10,200	11,064
U. S. Mail .....	\$ .....	.....	1,530	2,939	7,524	9,060	2,099	2,333	2,477	2,559
Public Service Revenue ¹.....	\$ .....	.....	.....	.....	.....	.....	7,127	5,618	6,241	5,791
Cargo ¹ .....	\$ .....	.....	529	639	1,474	1,851	1,837	2,464	2,754	2,599
Other .....	\$ .....	.....	3,798	3,102	1,106	1,574	1,662	3,747	7,680	4,221
Total .....	\$ .....	.....	8,349	9,438	15,961	19,300	19,204	22,324	29,352	26,234

All Cargo Airlines¹

Passenger .....	\$ .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Mail .....	\$ .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Priority .....	\$ .....	.....	.....	.....	.....	.....	.....	60	144	203
Non-Priority .....	\$ .....	.....	.....	.....	.....	.....	.....	.....	220	279
Public Service Revenue.....	\$ .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Express .....	\$ .....	.....	.....	.....	.....	.....	.....	.....	447	640
Freight .....	\$ .....	.....	.....	8,850	14,498	14,825	13,958	18,640	25,564	30,521
Other .....	\$ .....	.....	.....	3,511	2,549	4,391	3,001	8,335	26,485	56,025
Total .....	\$ .....	.....	.....	12,361	17,047	19,216	16,959	27,035	52,860	87,668

CONSOLIDATED INDUSTRY¹

Passenger	\$ 29,296	367,011	497,121	607,937	913,771	1,043,223	1,166,553	1,363,579	1,541,596	1,730,719
U. S. Mail .....	\$ .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Priority	\$ 24,397	47,016	118,172	122,596	117,945	63,213	55,437	53,644	59,773	63,428
Non-Priority .....	\$ .....	.....	.....	.....	.....	358	2,173	2,809	2,977	3,237
Public Service Revenues ¹.....	\$ .....	.....	.....	.....	.....	63,719	66,534	34,317	43,490	40,685
Express	\$	20,723	29,608	28,707	16,420	17,366	15,708	20,247	19,520	16,213
Freight ²	\$ 1,840	4,310	16,102	37,568	69,198	74,432	79,668	93,893	108,734	126,333
Other	\$ 2,465	24,899	30,876	43,112	48,278	50,973	51,732	66,441	100,471	135,765
Total	\$ 57,998	463,959	691,879	839,920	1,165,612	1,313,284	1,437,805	1,634,930	1,876,561	2,116,380

^P Preliminary.

N.A. Not Available.

¹ Data not available for Alaskan airlines in 1938 and 1946. All Cargo airlines began operations in fourth quarter of 1949. Local Service operations initiated in 1945. Helicopter operations started in 1947.

² Express and Freight combined and are reflected in Consolidated Industry freight totals.

³ Prior to October 1, 1953, public service revenues were not segregated from service mail payments.

DISTRIBUTION OF OPERATING EXPENSES

U. S. Scheduled Airline Industry (For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS HOW THE AIRLINES SPEND THEIR DOLLARS TO INSURE
FAST, SAFE, ECONOMICAL FLYING OPERATIONS AND EFFICIENT PASSENGER
AND CARGO HANDLING

Explanation of New Classification of Operating Expenses

The classification of operating expenses is different from that used in prior years. Owing to a revision of the form on which the carriers report to CAB it is not feasible to bring forward beyond 1956 the expense tables previously published in Facts and Figures. For this reason the data shown herein for years prior to 1956 were recast for this publication into the format of the new reporting system—insofar as it was feasible to do so. The data shown for 1957 are as reported by the carriers. Although the "matching" of prior years' data with 1957 is not perfect, it is considered adequate for general use where precision is not required.

The classifications of expenses employed in past issues of "Facts and Figures" were grouped as follows to fit the new format:

NEW CLASSIFICATION	OLD CLASSIFICATION
Flying operations	Flying operations
Maintenance	Direct maintenance—flight equipment Ground and indirect maintenance
Passenger service	Passenger service
Aircraft and traffic servicing	Ground operations

NEW CLASSIFICATION	OLD CLASSIFICATION
Promotion and sales	Traffic and sales Advertising and publicity
General and administrative	General and administrative
Depreciation and amortization	Depreciation—flight equipment Depreciation—ground equipment

As pointed out above, this method of matching accounts is not perfect. The figures for 1957 differ in the following respects from those shown for 1956 and earlier:

- 1) "Amortization of other deferred charges," dispersed throughout the accounts for 1956 and before, is grouped in "Depreciation and amortization" in 1957.
- 2) "Legal fees and expenses," dispersed in several accounts prior to 1957 is all in "General and administrative."
- 3) Payroll taxes and employee welfare insurance, included in "General and administrative" before 1957 are distributed to other appropriate accounts.
- 4) Airport ticket office expenses, included in "Promotion and Sales" for earlier years is under "Aircraft and Traffic Servicing."
- 5) Route extension and development expenses, not classified as operating expense in prior years, are included in "Depreciation and Amortization," in 1957.

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 P
Domestic Trunk Airlines										
Flying Operations	\$ 14,579	69,730	104,164	132,060	193,384	234,928	260,234	302,591	340,670	435,012
Maintenance	\$ 7,495	60,380	79,608	87,400	137,308	151,756	164,435	196,320	239,530	270,092
General Services & Administration										
Passenger Service	\$	26,895	29,151	30,870	47,045	53,115	58,235	72,996	83,953	95,519
Aircraft & Traffic Servicing	\$	59,854	64,915	68,541	94,606	107,044	119,207	133,274	152,928	217,125
Promotion & Sales	\$	43,231	55,011	62,645	89,133	103,499	114,149	134,706	159,366	157,662
General & Administrative	\$	28,250	31,217	33,651	46,874	52,259	57,744	68,473	79,462	55,529
Total G.S. & A.	\$ 15,577 ^a	158,230	180,294	195,707	277,658	315,917	349,335	409,449	475,709	525,835
Depreciation and amortization	\$ 5,666	28,773	47,212	46,371	64,542	87,820	104,755	101,709	106,321	146,932
Total Operating Expenses	\$ 43,317	317,121	411,278	461,538	672,892	790,421	878,759	1,010,069	1,162,230	1,377,871

See Footnotes at Bottom of Page 21

Distribution of Operating Expenses (continued)

	1938 ¹	1946 ¹	1948	1950	1952	1953	1954	1955	1956	1957 P
Local Service Airlines¹										
Flying Operations		497	4,433	8,330	13,394	15,748	17,246	18,080	21,616	26,487
Maintenance		568	3,403	5,256	8,601	10,075	9,615	10,384	12,610	16,604
General Services & Administration										
Passenger Service		30	540	1,090	1,944	2,218	2,389	2,687	3,385	4,009
Aircraft & Traffic Servicing		461	2,682	4,969	7,254	8,406	8,753	9,563	11,187	20,887
Promotion & Sales		125	1,439	3,241	6,040	7,439	8,344	9,287	11,399	6,076
General & Administrative		198	1,436	2,484	3,682	4,028	4,330	4,485	5,382	4,899
Total G.S. & A.		814	6,097	11,784	18,920	22,091	23,816	26,022	31,353	35,871
Depreciation & Amortization		181	1,645	1,836	2,582	2,989	2,428	2,278	2,714	3,749
Total Operating Expenses		2,060	15,578	27,206	43,497	50,903	53,105	56,764	68,293	82,711
Territorial Airlines										
Flying Operations	159	579	946	1,221	1,623	1,875	1,908	1,942	2,033	2,204
Maintenance	117	697	960	942	964	1,107	1,245	1,278	1,259	1,379
General Services & Administration										
Passenger Service		98	140	190	213	210	198	245	252	274
Aircraft & Traffic Servicing		699	904	906	1,001	1,212	1,269	1,258	1,317	1,506
Promotion & Sales		259	483	832	1,048	911	909	1,045	1,182	1,257
General & Administrative		407	567	743	899	953	955	964	848	867
Total G.S. & A.	142 ²	1,463	2,094	2,671	3,161	3,286	3,331	3,512	3,599	3,904
Depreciation & Amortization	127	298	433	452	224	489	596	603	416	496
Total Operating Expenses	545	3,037	4,433	5,286	5,972	6,757	7,080	7,335	7,307	7,983
Helicopter Airlines¹										
Flying Operations			94	205	264	541	583	614	697	1,108
Maintenance			89	182	337	701	808	871	981	1,381
General Services & Administration										
Passenger Service						11	15	21	21	
Aircraft & Traffic Servicing			33	98	138	278	334	425	544	
Promotion & Sales			2	2	3	43	107	180	312	
General & Administrative			43	112	164	306	365	393	496	
Total G.S. & A.			78	212	305	638	821	1,019	1,373	1,765 ²
Depreciation & Amortization			85	133	144	487	426	451	605	911
Total Operating Expenses			346	732	1,050	2,367	2,638	2,955	3,656	5,165
International and Overseas Airlines										
Flying Operations		32,447	67,163	70,980	87,368	91,489	98,755	108,501	125,613	143,195
Maintenance		24,838	44,460	43,440	54,231	55,027	53,113	58,975	72,069	72,467
General Services & Administration										
Passenger Service		9,255	14,034	14,589	19,554	20,027	22,372	26,773	31,053	32,519
Aircraft & Traffic Servicing		27,757	31,005	31,618	39,726	42,189	43,397	46,990	51,583	67,007
Promotion & Sales		18,598	33,211	36,514	47,486	51,419	54,846	61,980	70,822	70,765
General & Administrative		16,365	22,887	22,170	26,754	27,931	28,970	31,291	33,808	24,427
Total G.S. & A.		71,975	101,137	104,891	133,520	141,566	149,585	167,034	187,266	194,718
Depreciation & Amortization		10,583	22,527	29,012	29,148	29,825	31,233	31,094	34,593	50,365
Total Operating Expenses	14,303 ²	139,843	235,287	248,323	304,267	317,907	332,686	365,604	419,541	460,745

See Footnotes at Bottom of Page 21

Distribution of Operating Expenses (continued)

	1938 ¹	1946 ¹	1948 ¹	1950	1952	1953	1954	1955	1956	1957 ^P
Alaskan Airlines¹										
Flying Operations	\$		3,138	3,020	4,634	5,479	5,224	7,191	9,959	8,982
Maintenance	\$		1,448	2,365	4,667	4,592	4,577	5,273	5,744	6,013
General Services & Administration										
Passenger Service	\$		268	358	694	797	696	773	964	874
Aircraft & Traffic Servicing	\$		845	966	2,182	2,449	2,612	2,701	3,702	3,058
Promotion & Sales	\$		537	634	1,379	1,661	1,649	1,593	1,831	1,027
General & Administrative	\$		903	1,332	1,767	2,100	1,952	1,519	1,894	1,140
Total G.S. & A.	\$		2,553	3,290	6,022	7,007	6,909	6,586	8,391	9,958 ²
Depreciation & Amortization	\$		931	1,028	1,005	1,165	1,395	1,120	1,364	1,600
Total Operating Expenses	\$		8,070	9,703	16,328	18,243	18,105	21,706 ²	27,166 ²	26,553
All Cargo Airlines¹										
Flying Operations	\$			4,633	6,752	8,062	7,834	10,635	21,677	35,908
Maintenance	\$			1,769	3,683	3,921	3,806	5,287	11,662	19,519
General Services & Administration										
Passenger Service	\$					23	209	267	1,614	3,913
Aircraft & Traffic Servicing	\$			1,033	2,383	2,844	2,812	3,896	6,353	12,712
Promotion & Sales	\$			1,979	1,313	1,482	1,015	2,081	3,883	4,518
General & Administrative	\$			1,047	1,182	1,760	1,969	2,103	3,454	5,193
Total G.S. & A.	\$			4,059	4,878	6,109	6,005	8,347	15,304	26,336
Depreciation & Amortization	\$			329	604	999	2,128	2,074	3,155	8,548
Total Operating Expenses	\$			10,790	15,917	19,091	19,773	26,343	53,879 ²	90,311
TOTAL Scheduled Airline Industry										
Flying Operations	\$	14,738	103,253	179,938	220,449	307,419	358,122	391,784	449,554	522,265
Maintenance	\$	7,612	86,491	129,968	141,354	209,791	227,179	237,599	278,388	343,855
General Services and Administration										
Passenger Service	\$		36,278	44,133	47,097	69,450	76,401	84,114	103,762	121,242
Aircraft & Traffic Servicing	\$		88,771	100,384	108,131	147,290	164,422	178,384	198,107	227,614
Promotion & Sales	\$		62,213	90,683	105,847	146,402	166,454	181,019	210,872	248,795
General & Administrative	\$		45,220	57,053	61,539	81,322	89,337	96,285	109,228	125,344
Total G.S. & A.	\$	15,719 ²	232,482	292,253	322,614	444,464	496,614	539,802	621,969	722,995
Depreciation & Amortization	\$	5,793	39,835	72,833	79,161	98,249	123,774	142,961	139,329	149,168
Total Operating Expenses	\$	58,165 ²	462,061	674,992	763,578	1,059,923	1,205,689	1,312,146	1,490,776 ²	1,742,072 ²

^P Preliminary.

¹ Data not available for Alaskan airlines in 1938 and 1946. All Cargo airlines began operations in fourth quarter of 1949. Local Service operations initiated in 1945. Helicopter operations started in 1947.

² Detailed expense breakdown not available. 1938.

² Total is greater than sum of individual expense categories since segregation of expenses was not reported by some of the carriers.

SUMMARY OF PROFIT OR LOSS

U. S. Scheduled Airline Industry

(For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS THE AMOUNT OF DOLLARS THE AIRLINES WERE ABLE TO KEEP FOR PURCHASE OF NEW AIRCRAFT AND PAYMENT OF DIVIDENDS TO STOCKHOLDERS. IT ALSO SHOWS THESE DOLLARS AS A PER CENT OF SALES AND THE RATIO OF TOTAL RETURN TO INVESTMENT.

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 P
Domestic Trunk Airlines										
Total Operating Revenues.....\$	42,251	311,893	413,353	524,109	768,015	878,793	978,218	1,133,348	1,262,831	1,419,292
Total Operating Expenses.....\$	43,317	317,121	411,278	461,538	672,892	790,421	878,759	1,010,069	1,162,230	1,377,871
Net Operating Income.....\$	(1,066)	(5,228)	2,075	62,571	95,123	88,372	99,459	123,279	100,601	41,421
Interest on Long-Term Debt.....\$	N.A.	N.A.	4,246	4,331	5,162	6,555	6,808	6,540	9,964	16,201
Net Other Non-Operating Income.....\$	N.A.	N.A.	758	1,065	12,853	14,187	9,509	16,388	23,917	24,372
Income Taxes.....\$	N.A.	(513)	3,583	28,940	49,280	47,624	50,670	70,024	56,842	23,046
Net Profit or Loss.....\$	N.A.	(5,627)	(4,996)	30,365	53,534	48,380	51,490	63,103	57,712	26,546
Rate of Return on Investment ² (%).....\$	-----	-----	-----	-----	14.1	11.5	11.2	11.8	9.4	4.8
Profit Margin on Sales ¹ (%).....\$	-----	-----	-----	-----	7.0	5.5	5.3	5.6	4.6	1.9
Local Service Airlines¹										
Total Operating Revenues.....\$	-----	1,931	15,921	27,870	42,379	49,358	54,715	57,450	67,712	82,018
Total Operating Expenses.....\$	-----	2,060	15,578	27,206	43,497	50,903	53,105	56,764	68,293	82,711
Net Operating Income.....\$	-----	(129)	343	664	(1,118)	(1,545)	1,610	686	(581)	(693)
Interest on Long-Term Debt.....\$	-----	N.A.	97	86	157	252	145	219	376	224
Net Other Non-Operating Income.....\$	-----	N.A.	(732)	(754)	930	(283)	(252)	369	106	(106)
Income Taxes.....\$	-----	12	94	390	141	(47)	255	484	(50)	7
Net Profit or Loss.....\$	-----	(257)	(580)	(566)	(486)	(2,033)	958	352	(801)	(1,030)
Rate of Return on Investment ² (%).....\$	-----	-----	-----	-----	-----	-----	11.1	2.7	-----	-----
Profit Margin on Sales ¹ (%).....\$	-----	-----	-----	-----	-----	-----	1.8	0.6	-----	-----
Territorial Airlines										
Total Operating Revenues.....\$	594	3,381	4,650	5,213	6,246	6,726	6,790	7,114	7,430	8,314
Total Operating Expenses.....\$	545	3,037	4,433	5,286	5,972	6,757	7,080	7,335	7,307	7,983
Net Operating Income.....\$	49	344	217	(73)	274	(31)	(290)	(221)	123	331
Interest on Long-Term Debt.....\$	N.A.	N.A.	-----	1	5	117	129	106	97	109
Net Other Non-Operating Income.....\$	N.A.	N.A.	(50)	(61)	(15)	138	(35)	210	(14)	37
Income Taxes.....\$	N.A.	142	65	3	88	(51)	(27)	8	-----	19
Net Profit or Loss.....\$	N.A.	151	102	(138)	166	41	(427)	(125)	12	240
Rate of Return on Investment ² (%).....\$	-----	-----	-----	-----	5.7	3.9	-----	-----	3.3	10.5
Profit Margin on Sales ¹ (%).....\$	-----	-----	-----	-----	2.7	0.6	-----	-----	0.2	2.9
Helicopter Airlines¹										
Total Operating Revenues.....\$	-----	-----	372	798	1,046	2,605	3,070	3,355	3,711	5,032
Total Operating Expenses.....\$	-----	-----	346	732	1,050	2,367	2,638	2,955	3,656	5,165
Net Operating Income.....\$	-----	-----	26	66	(4)	238	432	400	55	(133)
Interest on Long-Term Debt.....\$	-----	-----	1	-----	4	9	11	11	23	64
Net Other Non-Operating Income.....\$	-----	-----	(29)	(30)	(42)	(61)	(68)	155	(63)	34
Income Taxes.....\$	-----	-----	-----	8	31	68	165	202	8	(51)
Net Profit or Loss.....\$	-----	-----	(4)	28	(81)	100	188	342	(39)	(112)
Rate of Return on Investment ² (%).....\$	-----	-----	-----	-----	-----	4.2	6.0	10.0	-----	-----
Profit Margin on Sales ¹ (%).....\$	-----	-----	-----	-----	-----	3.8	6.1	10.2	-----	-----

See Footnotes at Bottom of Page 23

Summary of Profit or Loss
(continued)

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 P
International and Overseas Airlines										
Total Operating Revenues.....	\$ 15,153	146,754	249,234	260,131	314,918	337,286	358,849	384,304	452,665	487,822
Total Operating Expenses.....	\$ 14,303	139,843	235,287	248,323	304,267	317,907	332,686	365,604	419,541	460,745
Net Operating Income.....	\$ 850	6,911	13,947	11,808	10,651	19,379	26,163	18,700	33,124	27,077
Interest on Long-Term Debt.....	\$ N.A.	N.A.	797	2,524	1,816	2,359	2,689	1,700	3,000	4,882
Net Other Non-Operating Income.....	\$ N.A.	N.A.	(4,370)	4,347	5,545	6,373	6,250	6,754	8,169	9,947
Income Taxes.....	\$ N.A.	2,634	2,415	3,623	6,651	10,865	12,924	10,320	17,792	13,474
Net Profit or Loss.....	\$ N.A.	(4,353)	6,365	10,008	7,729	12,528	16,800	13,434	20,501	18,668
Rate of Return on Investment ² (%).....	\$	-----	-----	-----	4.9	7.0	8.8	6.3	8.2	7.6
Profit Margin on Sales ³ (%).....	\$	-----	-----	-----	2.5	3.7	4.7	3.5	4.5	3.8
Alaskan Airlines¹										
Total Operating Revenues.....	\$	-----	8,349	9,438	15,961	19,300	19,204	22,324	29,352	26,234
Total Operating Expenses.....	\$	-----	8,070	9,703	16,328	18,243	18,105	21,706	27,166	26,553
Net Operating Income.....	\$	-----	279	(265)	(367)	1,057	1,099	618	2,186	(319)
Interest on Long-Term Debt.....	\$	-----	32	35	90	105	100	76	222	362
Net Other Non-Operating Income.....	\$	-----	(17)	(96)	379	(79)	125	228	(98)	573
Income Taxes.....	\$	-----	45	37	373	113	231	334	870	470
Net Profit or Loss.....	\$	-----	185	(433)	(451)	760	893	436	996	(578)
Rate of Return on Investment ² (%).....	\$	-----	-----	-----	-----	18.9	16.3	8.3	15.1	-----
Profit Margin on Sales ³ (%).....	\$	-----	-----	-----	-----	3.9	4.7	2.0	3.4	-----
All Cargo Airlines¹										
Total Operating Revenues.....	\$	-----	-----	12,361	17,047	19,216	16,959	27,035	52,860	87,668
Total Operating Expenses.....	\$	-----	-----	10,790	15,917	19,091	19,773	26,343	53,879	90,311
Net Operating Income.....	\$	-----	-----	1,571	1,130	125	(2,814)	692	(1,019)	(2,643)
Interest on Long-Term Debt.....	\$	-----	-----	-----	154	298	405	561	488	1,526
Net Other Non-Operating Income.....	\$	-----	-----	224	1,423	3,799	(185)	1,132	4,539	1,632
Income Taxes.....	\$	-----	-----	591	709	1,357	(1,624)	80	1,210	1,280
Net Profit or Loss.....	\$	-----	-----	1,204	1,690	2,269	(1,780)	1,183	1,822	(1,257)
Rate of Return on Investment ² (%).....	\$	-----	-----	-----	16.7	17.4	-----	9.4	7.0	0.5
Profit Margin on Sales ³ (%).....	\$	-----	-----	-----	9.9	11.8	-----	4.4	3.4	-----
CONSOLIDATED INDUSTRY										
Total Operating Revenues.....	\$ 57,998	463,959	691,879	839,920	1,165,612	1,313,284	1,437,805	1,634,930	1,876,561	2,116,380
Total Operating Expenses.....	\$ 58,165	462,061	674,992	763,578	1,059,923	1,205,689	1,312,146	1,490,776	1,742,072	2,051,339
Net Operating Income.....	\$ (167)	1,898	16,887	76,342	105,689	107,595	125,659	144,154	134,489	65,041
Interest on Long-Term Debt.....	\$ N.A.	N.A.	5,173	6,977	7,388	9,695	10,287	9,213	14,170	23,368
Net Other Non-Operating Income.....	\$ N.A.	N.A.	(4,440)	4,695	21,073	24,074	15,344	25,236	36,556	36,489
Income Taxes.....	\$ N.A.	2,275	6,202	33,592	57,273	59,929	62,594	81,452	76,672	38,245
Net Profit or Loss.....	\$ N.A.	(10,086)	1,072	40,468	62,101	62,045	68,122	78,725	80,203	42,477
Rate of Return on Investment ² (%).....	\$	-----	-----	-----	10.9	9.9	10.0	10.0	8.8	5.1
Profit Margin on Sales ³ (%).....	\$	-----	-----	-----	5.3	4.7	4.7	4.8	4.3	2.0

N.A. Not Available.

¹ Data not available for Alaskan airlines in 1938 and 1946. All Cargo airlines began operations in fourth quarter of 1949. Local Service operations initiated in 1945. Helicopter operations started in 1947.

() Denotes reverse item.

² Net income before interest and after taxes as percent of average net worth and long term debt.

³ Profit as percent of revenues.

P Preliminary.

ASSETS, LIABILITIES AND STOCKHOLDERS' EQUITY

U. S. Scheduled Airline Industry (For Selected Years, In Thousands of Dollars)

THIS TABLE SHOWS THE FINANCIAL SITUATION
OF THE SCHEDULED AIRLINES

	1938	1946	1950	1954	1956	(Sept. 30) 1957
Domestic Trunk Airlines^d						
Assets						
Current Assets	\$ 15,008	152,382	204,018	358,375	439,827	392,408
Investments and Special Funds	\$ 2,363	51,140	60,080	36,818	146,147	139,140
Flight Equipment	\$ 32,308	176,453	374,803	782,816	1,097,044	1,283,959
Reserve for Depreciation and Maintenance	\$ 16,473	58,569	173,183	394,292	553,793	612,018
Ground Property and Equipment	\$ b	46,636	94,476	143,166	180,613	197,051
Reserve for Depreciation	\$ b	16,042	40,947	68,926	89,217	98,247
Other Property	\$ 331	19,648	5,736	16,131	41,359	40,282
Deferred Charges	\$ 1,791	15,323	16,361	9,211	13,264	25,036
Other Assets	\$ 704	129	1,195	1,217	6,308	.....
Total Assets	\$ 36,032	387,100	542,539	884,516	1,281,552	1,367,611
Liabilities and Equity						
Current Liabilities	\$ 4,507	105,661	130,107	241,942	333,876	303,139
Long Term Debt	\$ 3,758	89,837	135,842	185,093	324,071	360,687
Other Non-current Liabilities	\$ c	260	.....	.....	.....	1,169
Operating Reserves	\$ 228	1,139	3,971	5,796	10,490	.....
Deferred Credits	\$ 1,105	9,298	17,327	12,533	37,646	52,127
Preferred Stock	\$ 630	40,000	60,499	71,000	16,592	15,960
Common Stock	\$ 20,196	52,897	62,970	68,360	88,555	107,391
Other Paid-in Capital	\$ 11,782	46,990	64,644	91,845	178,058	212,255
Retained Earnings	\$ (6,174)	41,018	67,179	207,947	291,872	315,182
Stockholders' Equity—Net	\$ 26,434	180,905	255,292	439,152	575,469	650,489
Total Liabilities and Equity	\$ 36,032	387,100	542,539	884,516	1,281,552	1,367,611
Local Service Airlines						
Assets						
Current Assets	\$	1,926	7,446	11,927	14,873	14,722
Investments and Special Funds	\$	917	549	559	1,438	2,297
Flight Equipment	\$	2,321	10,055	17,693	26,105	31,780
Reserve for Depreciation and Maintenance	\$	325	5,021	9,873	12,628	16,112
Ground Property and Equipment	\$	445	2,666	4,763	5,795	6,355
Reserve for Depreciation	\$	102	1,020	2,432	2,949	3,456
Other Property	\$	492	235	404	3,692	1,294
Deferred Charges	\$	574	1,884	1,018	1,564	1,976
Other Assets	\$	190	(28)	14	35	.....
Total Assets	\$	6,438	16,766	24,073	37,925	38,856
Liabilities and Equity						
Current Liabilities	\$	1,988	6,527	10,666	17,431	20,007
Long Term Debt	\$	500	1,485	1,931	7,800	8,408
Other Non-current Liabilities .....	\$ .....	.....	.....	.....	.....	179
Operating Reserves	\$	52	287	616	1,138	.....
Deferred Credits	\$	236	148	42	303	194
Preferred Stock .....	\$ .....	.....	440	300	920	163
Common Stock	\$	1,409	6,500	6,420	5,871	6,775
Other Paid-in Capital	\$	2,785	4,193	4,654	4,891	4,975
Retained Earnings	\$	(532)	(2,814)	(556)	(429)	(1,733)
Stockholders' Equity—Net	\$	3,662	8,319	10,818	11,253	10,068
Total Liabilities and Equity	\$	6,438	16,766	24,073	37,925	38,856

- FAA reported net property and equipment only.
- Property and equipment not segregated from flight equipment.
- Other non-current liabilities not segregated from long-term debt.
- Balance sheet data for domestic trunk airlines reflects international as well as domestic operations.

Note: Owing to a change in the reporting requirements, effective January 1, 1957, data for 1957 are not strictly comparable with other years. However, the data have been aligned so as to make them generally comparable.

Assets, Liabilities and Stockholders' Equity

(continued)

(Sept. 30)
1957

1938 1946 1950 1954 1956

Territorial Airlines

Assets

Current Assets	\$ 135	477	1,743	1,084	1,241	2,021
Investment and Special Funds	\$ 72	206	228	8	15	15
Flight Equipment	\$ 748	1,791	2,724	5,866	6,057	5,831
Reserve for Depreciation and Maintenance	\$ 478	683	1,858	2,562	2,930	3,170
Ground Property and Equipment	\$ b	750	1,008	1,227	1,276	1,328
Reserve for Depreciation	\$ b	282	486	737	847	918
Other Property	\$	122	69	21	17	110
Deferred Charges	\$ 29	63	228	157	169	121
Other Assets	\$ 32		5			
Total Assets	\$ 538	2,444	3,661	5,064	4,998	5,338

Liabilities and Equity

Current Liabilities	\$ 35	649	921	1,468	1,520	1,816
Long-Term Debt	\$ 2	83		1,725	1,702	1,703
Other Non-Current Liabilities	\$ c					
Operating Reserves	\$ 25	15	61	15	41	
Deferred Credits	\$	73	91	1	68	17
Preferred Stock	\$					
Common Stock	\$ 448	932	2,768	2,681	1,981	1,981
Other Paid-In Capital	\$	360	372	132	832	832
Retained Earnings	\$ 28	332	(552)	(958)	(1,146)	(1,011)
Stockholders' Equity—Net	\$ 476	1,624	2,588	1,855	1,667	1,802
Total Liabilities and Equity	\$ 538	2,444	3,661	5,064	4,998	5,338

Helicopter Airlines

Assets

Current Assets	\$		263	2,659	2,307	2,124
Investment and Special Funds	\$		10	20	290	27
Flight Equipment	\$		528	2,285	3,878	5,158
Reserve for Depreciation and Maintenance	\$		286	1,176	1,645	2,185
Ground Property and Equipment	\$		49	235	576	741
Reserve for Depreciation	\$		21	105	197	279
Other Property	\$		5	28	71	67
Deferred Charges	\$		123	145	196	208
Other Assets	\$		61	22		
Total Assets	\$		732	4,113	5,476	5,861

Liabilities and Equity

Current Liabilities	\$		69	657	735	1,069
Long-Term Debt	\$			204	817	1,136
Other Non-Current Liabilities	\$					
Operating Reserves	\$			33	45	
Deferred Credits	\$			14	69	92
Preferred Stock	\$		320	256		
Common Stock	\$		375	643	702	734
Other Paid-In Capital	\$			1,996	2,435	2,546
Retained Earnings	\$		(32)	310	673	284
Stockholders' Equity—Net	\$		663	3,205	3,810	3,564
Total Liabilities and Equity	\$		732	4,113	5,476	5,861

International and Overseas Airlines¹

Assets

Current Assets	\$ 3,368	98,283	94,012	100,188	111,560	117,935
Investment and Special Funds	\$ 3,915	19,576	8,632	21,274	37,987	43,727
Flight Equipment	\$ 16,514a	59,626	133,488	194,286	265,785	281,907
Reserve for Depreciation and Maintenance	\$ 1,150	15,315	55,495	91,398	114,074	132,220
Ground Property and Equipment	\$ b	14,915	22,677	27,763	31,813	33,453
Reserve for Depreciation	\$	7,024	11,738	16,751	18,614	20,232
Other Property	\$ 268	8,542	1,297	2,487	2,450	3,360
Deferred Charges	\$ 272	8,753	25,688	4,689	4,440	4,447
Other Assets	\$ 5,829		562			
Total Assets	\$ 29,016	187,356	219,123	242,538	321,347	332,377

(International and Overseas Airlines
continued on next page)

See Footnotes at Bottom of Page 24

Assets, Liabilities and Stockholders' Equity

(continued)

	1938	1946	1950	1954	1956	(Sept. 30) 1957
International and Overseas Airlines						
<i>Liabilities and Capital</i>						
Current Liabilities	\$ 4,005	39,401	52,647	81,624	92,352	97,703
Long-Term Debt	\$ 1,000		41,250	29,575	83,406	85,351
Other Non-Current Liabilities	\$ 122	69,308	224			2,723
Operating Reserves	\$	16,999	5,784	3,706	3,584	
Deferred Credits	\$ 368	10,660	19,803	4,089	6,058	6,102
Preferred Stock	\$	150	150			
Common Stock	\$ 9,534	16,515	10,910	13,747	13,792	13,802
Other Paid-In Capital	\$ 10,886	21,518	62,829	63,120	63,460	63,529
Total Retained Earnings	\$ 2,851	12,805	25,655	47,261	59,119	63,591
Stockholders' Equity—Net	\$ 23,521	50,988	99,415	123,544	135,947	140,498
Total Liabilities and Capital	\$ 29,016	187,356	219,123	242,538	321,347	332,377
Alaskan Airlines¹						
<i>Assets</i>						
Current Assets	\$		2,705	4,592	7,129	7,514
Investment and Special Funds	\$		91	186	532	908
Flight Equipment	\$		4,630	8,251	11,126	13,046
Reserve for Depreciation and Maintenance	\$		3,127	5,307	5,539	6,161
Ground Property and Equipment	\$		1,611	3,418	4,201	4,491
Reserve for Depreciation	\$		635	1,335	1,808	2,070
Other Property	\$		150	144	400	624
Deferred Charges	\$		226	171	422	572
Other Assets	\$		190	161	134	
Total Assets	\$		5,841	10,281	16,597	18,924
<i>Liabilities and Equity</i>						
Current Liabilities	\$		2,532	3,471	6,170	7,669
Long-Term Debt	\$		486	1,420	3,360	4,534
Other Non-Current Liabilities	\$					19
Operating Reserves	\$		314	371	276	60
Deferred Credits	\$		56	157	42	60
Preferred Stock	\$		84			168
Common Stock	\$		2,036	2,886	3,152	3,034
Other Paid-In Capital	\$		2,960	3,588	3,613	3,615
Retained Earnings	\$		(2,627)	(1,612)	(16)	(156)
Stockholders' Equity—Net	\$		2,453	4,862	6,749	6,642
Total Liabilities and Equity	\$		5,841	10,281	16,597	18,924
All Cargo Airlines						
<i>Assets</i>						
Current Assets	\$		5,822	7,683	21,224	20,610
Investment and Special Funds	\$		379	248	17,244	4,547
Flight Equipment	\$		2,631	20,496	31,540	61,623
Reserve for Depreciation and Maintenance	\$		833	6,153	9,188	13,840
Ground Property and Equipment	\$		1,049	2,341	4,666	5,306
Reserve for Depreciation	\$		561	1,110	1,833	2,261
Other Property	\$		16	103	3,028	2,928
Deferred Charges	\$		423	271	2,706	5,188
Other Assets	\$				281	
Total Assets	\$		8,926	23,879	69,668	84,101
<i>Liabilities and Equity</i>						
Current Liabilities	\$		3,682	5,594	19,301	25,054
Long-Term Debt	\$		1,531	7,262	16,813	26,173
Other Non-Current Liabilities	\$					747
Operating Reserves	\$		321	1,598	2,311	
Deferred Credits	\$		45	52	2,277	2,972
Preferred Stock	\$			992	1,441	1,437
Common Stock	\$		4,183	5,117	6,863	7,558
Other Paid-In Capital	\$		3,135	2,352	14,341	15,916
Retained Earnings	\$		(3,971)	912	6,321	4,498
Stockholders' Equity—Net	\$		3,347	9,373	28,966	29,155
Total Liabilities and Equity	\$		8,926	23,879	69,668	84,101

See Footnotes at Bottom of Page 24

Assets, Liabilities and Stockholders' Equity

(continued)

	1938	1946	1950	1954	1956	(Sept. 30) 1957
Consolidated Industry						
Assets						
Current Assets	\$ 18,311	253,068	316,009	486,508	598,161	557,334
Investment and Special Funds	\$ 6,350	71,839	69,969	59,113	203,653	190,661
Flight Equipment	\$ 49,570	240,191	528,859	1,031,693	1,441,535	1,683,304
Reserve for Depreciation and Maintenance	\$ 18,101	74,892	239,803	510,761	699,797	785,706
Ground Property and Equipment	\$	62,746	123,536	182,913	228,940	248,725
Reserve for Depreciation	\$	23,450	55,408	91,396	115,465	127,463
Other Property	\$ 599	28,804	7,508	19,318	51,017	48,665
Deferred Charges	\$ 2,092	24,713	44,933	15,662	22,761	37,548
Other Assets	\$ 6,565	319	1,985	1,414	6,758	.....
Total Assets	\$ 65,586	583,338	797,588	1,194,464	1,737,563	1,853,068
Liabilities and Equity						
Current Liabilities	\$ 8,547	147,699	196,485	345,422	471,385	456,457
Long-Term Debt	\$ 4,760	90,420	180,594	227,210	437,969	487,992
Other Non-Current Liabilities	\$ 122	69,568	224	.....	.....	4,837
Operating Reserves	\$ 253	18,205	10,738	12,135	17,885	.....
Deferred Credits	\$ 1,473	20,267	37,470	16,888	46,463	61,564
Preferred Stock	\$ 630	40,150	61,493	72,548	18,953	17,728
Common Stock	\$ 30,178	71,753	89,742	99,854	120,916	141,275
Other Paid-In Capital	\$ 22,668	71,653	138,133	167,687	267,630	303,668
Retained Earnings	\$ (3,295)	53,623	82,838	253,304	356,394	380,655
Stockholders' Equity—Net	\$ 50,431	237,179	372,077	592,809	763,861	842,218
Total Liabilities and Equity	\$ 65,586	583,338	797,588	1,194,464	1,737,563	1,853,068

See Footnotes at Bottom of Page 24

DOMESTIC INTERCITY PASSENGER MILE MARKET

(For Selected Years, In Millions)

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 ^a
Pullman and Air Travel										
Rail Pullman (Class I) ¹	7,354	19,801	11,015	9,338	9,504	7,950	6,850	6,440	6,275	5,349
Air—First Class ²	457	5,910	5,905	6,898	10,105	10,970	11,375	13,025	14,202	15,740
Air—Coach ³ .....	.....	.....	5	1,057	2,356	3,718	5,321	6,716	8,074	9,510
Total Air	457	5,910	5,910	7,955	12,461	14,688	16,696	19,741	22,276	25,250
Pullman and Air Combined	7,811	25,711	16,925	17,293	21,965	22,638	23,546	26,181	28,551	30,599
% Airline of Combined Total	5.85	22.99	34.92	46.00	56.73	64.88	70.91	75.40	78.02	82.52
Other Common Carriers										
Rail Coach (Class I, II, III) ¹	10,240	39,119	24,360	17,473	19,781	18,979	17,710	17,329	17,105	16,365
Intercity Motor Bus (Class I, II, III) ⁴	8,800 ⁵	26,293	23,529	21,254	21,223	19,634	16,934	16,562	16,409 ⁶	16,023
Total	19,040	65,412	47,889	38,727	41,004	38,613	34,644	33,891	33,514	32,388
Total Common Carrier	26,851	91,123	64,814	56,020	62,969	61,251	58,190	60,072	62,065	62,987
% Airline of Common Carrier	1.70	6.49	9.12	14.20	19.79	23.98	28.69	32.86	35.89	40.09
Private Intercity Automobile ⁸	226,279	253,570	287,400	402,843	495,547	529,194	548,763	585,800	617,700	655,400
Total Common and Auto Carrier	253,130	344,693	352,214	458,863	558,516	590,445	606,953	645,872	679,765	718,387
% Airline of Total Intercity Travel .....	.18	1.71	1.68	1.73	2.23	2.49	2.75	3.06	3.28	3.51
Passenger Miles per Capita ⁷	1,950	2,461	2,411	3,045	3,568	3,730	3,765	3,931	4,064	4,218

¹ 1938-1954 from Railroad Transportation 12/56 AAR, p. 19. 1955-1956 from Transport Economics May 1957, p. 14.

² 1938 CAB Annual Airline Statistics, 1938-44 Revised to Airport to Airport Mileages, 1944-1952 CAB Handbook, 1953-56 CAB Monthly Report Air Carrier Traffic.

³ Rail Coach Class I. Same as No. 1. Excludes commutation. Rail Coach Class II & III, 1938-56 Statistics of Railways of United States, ICC.

⁴ 1946-1956 from Transport Economics, December 1957, p. 9.

⁵ 1950-1956 Transport Economics May 1956, October 1957. 1938-48 from Exhibit 915, ICC Docket M-C-550 not comparable with 1950-57 Data.

⁶ Based on mid-year population estimate by Census Bureau.

⁷ Preliminary.

⁸ Partially Estimated.

REVENUE PASSENGERS CARRIED

U. S. Scheduled Airline Industry (For Selected Years, In Thousands of Passengers)

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 ²
Domestic Trunk Airlines	1,168	11,890	12,324	15,978	22,759	26,137	29,526	34,511	37,598	40,275
Local Service Airlines .....	.....	25	426	969	1,736	2,032	2,423	2,897	3,453	3,949
Territorial Airlines	29	299	418	477	515	553	561	591	627	589
Helicopter Airlines .....	.....	.....	.....	.....	.....	1	9	29	62	152
International and Overseas Airlines	109	1,041	1,373	1,675	2,362	2,682	2,888	3,376	3,888	4,065
Alaskan Airlines¹ .....	.....	.....	111	144	194	220	225	264	315	309
TOTAL SCHEDULED AIRLINE INDUSTRY	1,306	13,255	14,652	19,243	27,566	31,625	35,632	41,623	45,943	49,339

¹ Alaskan data for 1948 thru 1950 includes charter flights. Data prior to 1948 not available.

² Passengers reported on a different basis for 1957 from prior years, hence data not entirely comparable with prior years.

AVERAGE REVENUE PER PASSENGER MILE

Intercity Common Carriers (For Selected Years, In Cents per Mile)

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957 ²
Domestic Scheduled Airlines¹										
Coach or Tourist .....	.....	.....	.....	4.10	4.18	4.13	4.34	4.32	4.29	4.25
All Services	5.32	4.62	5.75	5.54	5.54	5.43	5.37	5.32	5.28	5.25
International Scheduled Airlines										
Coach or Tourist .....	.....	.....	.....	.....	.....	5.77	5.83	n.a.	n.a.	5.77
All Services	8.34	8.31	8.01	7.28	7.04	6.88	6.79	6.68	6.70	6.56
Railroads, Class 1										
First Class ³	2.37	2.45	3.01	3.25	3.35	3.38	3.35	3.31	3.39	3.68
Coach	1.86	1.82	2.29	2.47	2.53	2.53	2.50	2.47	2.56	2.71
Intercity Motor Busses	1.56 ⁴	1.66	1.74	1.88	2.02	2.05	2.07	2.06	2.12	2.15

¹ Trunk airlines.

² Partly estimated.

³ Does not include payments to Pullman Company for seat, berth, etc.

⁴ 1939—first year available.

N.A. Not available.

Note: Average passenger fare is derived by dividing passenger revenue by passenger miles.

AIRCRAFT OWNED

By U. S. Scheduled Airline Industry (For Selected Years)

THIS TABLE SHOWS HOW THE SIZE AND TYPE OF AIRCRAFT USED
BY THE SCHEDULED AIRLINES HAS IMPROVED OVER THE YEARS

Aircraft	Type	1938	1946	1952	1954	1956	(Feb 6) 1958
Boeing:	247D, 307B	39	12	....	....	....	....
	377	....	....	44	48	34	33
Convair:	240	....	....	113	102	100	100
	340	....	....	8	121	123	134
	440	....	....	....	....	19	31
Curtiss:	C46	....	n.a.	75	60	94	75
Douglas:	pre DC-3	88	....	....	....	....	....
	DC-3	75	538	419	339	356	330
	DC-4	....	200	185	155	143	93
	DC-6	....	....	195	251	299	345
	DC-7	....	....	....	61	132	207
Lockheed:	Electra	40	3	....	....	....	....
	Lodestar	....	11	11	11	10	10
	Other early models	14	n.a.	....	....	....	....
	Constellation	....	35	115	111	117	121
	Super Constellation	....	....	24	39	79	128
Martin:	130	2	....	....	....	....	....
	202	....	....	21	25	23	25
	404	....	....	96	100	97	85
Sikorsky:	(series)	26	....	....	....	....	....
Vickers:	Viscount	....	....	....	....	54	59
Other		33	n.a.	17	20	25	27
Total Fixed Wing		317	799	1323	1443	1705	1803
Helicopters:							
Bell	B-47	....	....	6	6	7	6
Sikorsky	S-51	....	....	3	3	2	2
	S-55	....	....	5	11	8	12
	S-58	....	....	....	....	3	6
Total Helicopters		....	....	14	20	20	26

AIRCRAFT ON ORDER

U. S. Scheduled Airlines (As of January 1, 1958)

THIS TABLE SHOWS HOW THE SCHEDULED AIRLINES WILL CONTINUE TO ADD NEW
AND FASTER AIRCRAFT TO INSURE IMPROVED SERVICE FOR THEIR CUSTOMERS

Aircraft Type	Total on Order	Year of Delivery			
		1958	1959	1960	1961
Jets					
Boeing 707	70	5	55	10	....
Boeing 720	11	....	....	11	....
Convair 440	49	....	2	41	6
Douglas DC-8	100	....	13	83	4
Prop Jets					
Bristol Britannia	5	5	....	....	....
Fairchild Friendship	31	24	7	....	....
Lockheed Electra	116	14	76	26	....
Vickers Viscount	15	15	....	....	....
Fixed Wing					
Douglas DC-6A, B	28	28	....	....	....
Douglas DC-7	38	38	....	....	....
Lockheed 1049H	4	4	....	....	....
Helicopters					
Vertol 44B	5	5	....	....	....
S-58C	2	2	....	....	....

COMPARATIVE TRANSPORT SAFETY RECORD

*Passenger Fatality Rate per 100,000,000 Passenger Miles
(For Selected Years)*

	1938	1946	1948	1950	1952	1953	1954	1955	1956	1957
Domestic Scheduled Airlines										
Fatalities	25	75	83	96	46	86	16	156	143	30
Rate	5.47	1.27	1.40	1.21	.37	.59	.10	.79	.64	.12
International and Overseas Scheduled Airlines¹										
Fatalities	7	40	20	48	94	2	0	2	9	40
Rate .....	.13	3.51	1.02	2.10	2.98	.06	.....	.04	.17	.67
Motor Buses										
Fatalities	²	140	120	100	100	70	60	100	80	n.a.
Rate	²	0.19	.18	.17	.16	.13	.11	.19	.16	n.a.
Railroad Passenger Trains										
Fatalities	79	115	52	184	14	50	23	19	57	16 ³
Rate	0.36	0.18	.13	.58	.04	.16	.08	.07	.20	.06 ³
Passenger Autos and Taxis										
Fatalities	16,000	15,400	15,200	17,600	22,600	23,500	22,500	24,700	26,100	n.a.
Rate	3.9	2.5	2.1	2.2	2.8	2.9	2.6	2.7	2.7	n.a.

¹ Alaska data not included prior to 1948.

² Motor Bus statistics included in Passenger Autos and Taxis.

³ Preliminary
n.a. Not Available.

COMPARISON OF RAIL AND AIR FARES WITH TRAVEL TIMES

CITY—PAIR	FARES				TIME	
	Coach		First Class ¹		Air	Rail
	Air	Rail	Air	Rail		
Boston—New York	\$ 10.80	9.42	13.65	16.60	:55	4:15
Detroit—Boston	\$ 32.35	29.56	42.30	54.28 ²	2:25	15:30
Chicago—New York	\$ 34.10 ²	35.55	47.95	61.72	2:25	15:30
New York—Miami	\$ 46.80 ²	42.92	80.80	77.66	3:50	24:15
New York—Washington	\$ 12.55	8.78	16.00	18.46	1:00	3:50
Los Angeles—New York	\$ 104.00	89.87	166.25	161.60	7:42	56:05
Philadelphia—Atlanta	\$ 30.35 ²	24.41	48.10	43.75	2:38	20:07
Chicago—Washington	\$ 28.60 ²	30.00	40.35	52.98	2:05	15:20
Washington—New Orleans	\$ 45.00 ²	34.49	67.55	61.59	3:11	24:10
Atlanta—Chicago	\$ 28.05 ²	22.03	43.75	40.01	2:27	19:15
Atlanta—Dallas	\$ 33.15 ²	24.99	53.45	44.84	2:28	26:40
Cincinnati—Miami	\$ 42.95 ²	36.46	68.10	73.95	3:25	18:45
Cincinnati—Pittsburgh	\$ 15.90	12.02	20.45	23.18	1:18	7:20
Chicago—Houston	\$ 48.85 ²	32.97	71.35	59.67	4:15	22:55
Chicago—St. Louis	\$ 14.25 ²	5.80	18.25	17.06	1:13	5:30
Los Angeles—Chicago	\$ 80.05	85.56	120.35	109.76	5:25	39:30
St. Louis—New Orleans	\$ 30.15 ²	19.43	42.85	36.41	2:45	14:30
Chicago—Kansas City	\$ 20.80	12.66	28.20	24.02	1:35	8:40
Denver—Dallas	\$ 38.05	23.03	50.00	42.41	4:45	17:20
Denver—San Francisco	\$ 48.85	37.63	68.75	70.38	3:15	33:10
Dallas—San Francisco	\$ 70.70	50.65	102.85	91.06	4:45	43:15
St. Louis—Los Angeles	\$ 76.95	56.18	109.15	101.77	4:55	47:45
St. Louis—Phoenix	\$ 66.55	47.68	89.40	86.49	5:17	32:50
Los Angeles—San Francisco	\$ 15.05	14.35	23.95	25.90	1:32	9:45
Portland—Seattle	\$ 8.15	6.05	10.75	12.86	:44	4:00
Salt Lake City—Portland	\$ 34.50	24.39	45.30	45.61	4:01	25:05

¹ Rail fare includes price of lower berth.

² Roomette, where no berth charge is shown on timetable.

² Night coach, all other air-coach fares are day-coach rates.

CLASSES OF UNITED STATES COMMERCIAL AIR CARRIERS

At the present time there are seven recognized classes of air carriers in the air transport industry of the United States. This classification is used by the Civil Aeronautics Board in connection with the economic regulation of the industry and under the Civil Aeronautics Act is based largely on the scope of operations authorized or allowed by that Act. Classes One to Six have certificates of convenience and necessity and conduct regularly scheduled services.

- 1. The Domestic Trunk Lines** include those carriers which presently have permanent operating rights within the continental United States. These rights derive largely from operations by present or predecessor companies antedating the Civil Aeronautics Act of 1938 which granted them "grandfather rights." There are currently twelve trunk lines, most of which operate high-density traffic routes between the principal traffic centers of the United States.

American Braniff Capital	Continental Delta Eastern	National Northeast Northwest	Trans World United Western
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- 2. The Domestic Local Service Lines** have, with one exception, been certificated since 1945. These carriers operate routes of lesser traffic density between the smaller traffic centers and between these centers and principal centers. The thirteen local service lines in 1957 were:

Allegheny Bonanza Central Frontier	Lake Central Mohawk North Central	Ozark Pacific Piedmont	Southern Trans Texas West Coast
---	---	------------------------------	---------------------------------------

- 3. The International and Overseas Lines** include all U. S. flag air carriers operating between the United States and foreign countries other than Canada. Some of these carriers conduct operations between foreign countries and some are extensions of domestic trunk lines into Mexico and the Caribbean.

Alaska American Braniff Caribbean Atlantic Delta	Eastern Mackey ² National Northwest Pacific Northern	Pan American Pan American-Grace Resort ^{1 2} Samoan ^{2 3} South Pacific ^{2 3}	Trans Caribbean ² Trans World U. M. C. A. ² United Western
--	---	--	--

- 4. The Territorial Lines** include two groups of carriers. The Insular Lines operate in the U. S. Island possessions in the Pacific and the Caribbean and the Alaskan Lines operate between the U. S. and Alaska and within Alaska.

INSULAR LINES

Hawaiian
Trans-Pacific

ALASKAN LINES

Operating between the U. S. and Alaska

Alaska ⁴
Northwest ⁵
Pacific Northern ⁴
Pan American ⁵

Operators within Alaska

Alaska
Alaska Coastal
Bristol Bay ^{2 3}
Cordova
Ellis
Howard J. Mays ²
Northern Consolidated
Pacific Northern
Pan American
Reeve Aleutian
Wien

- 5. The Helicopter Airmail Lines** presently operate between airports, central post offices, and suburbs in New York, Chicago and Los Angeles. Originally certificated as exclusive mail carriers they now fly passengers, air freight and air express. These carriers hold temporary certificates and are considered to be experimental in nature.

Chicago Helicopter Airways

Los Angeles Airways

New York Airways

- 6. The All Cargo Lines** operate under temporary certificates authorizing scheduled cargo flights between designated areas in the U. S., and in one case to the Caribbean and in another to Europe.

AAXICO
Aerovias Sud Americana

Flying Tigers
Riddle

Seaboard & Western
Slick

- 7. Non-Certificated Air Carriers** include a diversified group of operators who, with the exception of the air taxi operators and air freight forwarders, are not authorized to engage in regularly scheduled service. They are described in the CAB 1954 Annual Report as follows:

Operators of various types of air services have been authorized by the Board through the exemption process, rather than through the requirement that a certificate of convenience and necessity be obtained. As of December 31, 1957 this group includes:

Supplemental and irregular transport carriers	43
Air freight forwarders	65

¹ Certificated cruise carrier.

² Certificated non-mail carriers.

^{1 2 3} Statistical data of these carriers are not included in the statistical tables.

³ Not operating.

⁴ Statistical data of these carriers are included with Alaskan Airlines.

⁵ Statistical data of these carriers are included with International and Overseas Airlines.

**OFFICERS**

Stuart G. Tipton, *President*
Milton W. Arnold, *V. P., Operations & Engineering*
Stanley Gewirtz, *V. P., Assistant to the President*
John Hoving, *V. P., Public Relations*
E. F. Kelly, *V. P., Finance & Accounting*
W. N. Martin, *V. P., Public Affairs*
J. L. O'Brien, *V. P., Personnel Relations Conference*

Leo Seybold, *V. P., Federal Affairs*
Robert L. Turner, *V. P., Traffic*
John E. Stephen, *General Counsel*
F. J. Macklin, *Assistant V. P., Traffic*
J. D. Durand, *Secretary*
J. F. Hintersehr, *Treasurer*

DIRECTORS

C. E. Beard (Braniff)
Nick Bez (West Coast)
J. H. Carmichael (Capital)
T. H. Davis (Piedmont)
J. S. Gleason (Chicago Helicopter)
W. A. Patterson (United)

W. L. Pierson (Trans World)
R. W. Prescott (Flying Tiger)
E. V. Rickenbacker (Eastern)
C. R. Smith (American)
J. T. Trippe (Pan American)
C. E. Woolman (Delta)

MEMBER AIRLINES

AAXICO Airlines, Howard J. Korth, Pres., P. O. Box 875, Miami Int'l Airport Branch, Miami, Florida.
Alaska Airlines, Chas. F. Willis, Pres., 2320 Sixth Avenue, Seattle 1, Washington
Alaska Coastal Airlines, O. F. Benecke, Co-Manager, 2 Marine Way, Juneau, Alaska
Allegheny Airlines, Leslie O. Barnes, Pres., Washington National Airport, Washington 1, D. C.
American Airlines, C. R. Smith, President, 100 Park Avenue, New York 17, New York
Bonanza Air Lines, Edmund Converse, Pres., McCarran Field, P. O. Box 391, Las Vegas, Nevada
Braniff Int'l Airways, C. E. Beard, Pres., Love Field, Dallas 35, Texas
*Canadian Pacific Airlines, G. W. G. McConachie, Pres., Sea Island Airport, Vancouver AMF, B. C., Canada
Capital Airlines, J. H. Carmichael, Chairman of the Board, Washington National Airport, Washington 1, D. C.
*Caribbean Atlantic Airlines, Dionisio Trigo, Pres., P. O. Box 6035, Loiza Street Station, Santurce, Puerto Rico
Central Airlines, Keith Kable, Pres., Meacham Field, Fort Worth 7, Texas
Chicago Helicopter Airways, John S. Gleason, President & Treasurer, 5240 W. 63rd Street, Chicago 38, Illinois
Continental Air Lines, Robert F. Six, Pres., P. O. Box 9063, Denver 16, Colorado
Cordova Airlines, Merle K. Smith, President & Gen. Mgr., P. O. Box 6203, Anchorage, Alaska
Delta Air Lines, C. E. Woolman, Pres. & Gen. Mgr., Atlanta Airport, Atlanta, Georgia
Eastern Air Lines, E. V. Rickenbacker, Chairman of the Board & Gen. Mgr., 10 Rockefeller Plaza, New York 20, New York
Ellis Air Lines, R. E. Ellis, Pres., P. O. Box 1059, Ketchikan, Alaska
The Flying Tiger Line, Robert W. Prescott, Pres., Lockheed Air Terminal, Burbank, California
Frontier Airlines, C. A. Myhre, Pres., Stapleton Airfield, Denver 7, Colorado
*Hawaiian Airlines, A. D. Lewis, Pres., Honolulu International Airport, Honolulu 17, T. H.
Lake Central Airlines, Guin Hicks, Pres., Weir Cook Municipal Airport, Indianapolis 44, Indiana
Los Angeles Airways, C. M. Belinn, Pres., Box 45155, Airport Sta., Los Angeles 45, California
Mackey Airlines, Joseph C. Mackey, Pres., Broward County Int'l Airport, Ft. Lauderdale, Florida
Mohawk Airlines, Robert E. Peach, Pres., Oneida County Airport, Utica, New York
National Airlines, G. T. Baker, Pres., P. O. Box NAL, Int'l Airport Branch, Miami 48, Florida
New York Airways, Robert L. Cummings, Jr., Pres., P. O. Box 426, LaGuardia Airport Station, Flushing 71, New York
North Central Airlines, Hal N. Carr, Pres., 6201 34th Ave., South Minneapolis 23, Minn.
Northeast Airlines, George E. Gardner, Chairman of the Board, Logan Int'l Airport, E. Boston 28, Mass.
Northern Consolidated Airlines, Raymond I. Petersen, Pres. & Gen. Mgr., 414 Fourth Avenue, Anchorage, Alaska
Northwest Airlines, D. W. Nyrop, Pres., 1885 University Avenue, St. Paul 1, Minnesota
Ozark Air Lines, Laddie H. D. Hamilton, Pres., Box 6007, Lambert Field, St. Louis 21, Missouri
Pacific Air Lines, Inc., John H. Connelly, Pres., San Francisco International Airport, San Francisco, California
Pacific Northern Airlines, A. G. Woodley, President, 1626 Exchange Building, Seattle 4, Washington
Pan American-Grace Airways, Andrew B. Shea, Pres., 135 E. 42nd Street, New York 17, New York
Pan American World Airways, J. T. Trippe, Pres., 135 E. 42nd Street, New York 17, New York
Piedmont Airlines, T. H. Davis, President, Smith Reynolds Airport, Winston-Salem 1, N. C.
Reeve Aleutian Airways, Robert C. Reeve, Pres. & Supt. Operations, 420 D Street, Box 559, Anchorage, Alaska
Resort Airlines, Harold L. Graham, Jr., Pres., Suite 326, 1346 Connecticut Ave., N. W., Washington 6, D. C.
Riddle Airlines, John Paul Riddle, Chairman of the Board, P. O. Box 535, Miami International Airport Branch, Miami 48, Florida
Seaboard & Western Airlines, Raymond A. Norden, Pres., 80 Broad Street, New York 4, New York
Southern Airways, Frank W. Hulse, Pres., 1140 Brown-Marx Building, Birmingham, Alabama
*Trans-Canada Air Lines, W. Gordon Wood, Vice President-Traffic, Room 422, International Aviation Bldg., 1080 University Street, Montreal 3, Quebec, Canada
Trans Caribbean Airways, Inc., O. Roy Chalk, Pres., 200 W. 57th Street, New York 19, New York
Trans Texas Airways, R. E. McKangban, Pres., 1221 Commerce Building, Houston 2, Texas
Trans World Airlines, Warren Lee Pierson, Chairman of the Board, 806 Connecticut Avenue, Washington 6, D. C.
United Air Lines, W. A. Patterson, Pres., 5959 S. Cicero Avenue, Chicago 38, Illinois
West Coast Airlines, Nick Bez, Pres., Boeing Field, Seattle 8, Washington
Western Air Lines, T. C. Drinkwater, Pres., 6060 Avion Drive, Los Angeles 45, California
Wien Alaska Airlines, Sigurd Wien, President & General Manager, Box 649, Fairbanks, Alaska

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years of in-flight service on military and commercial aircraft.

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CORPORATION

Roseland, New Jersey • Western Plant: Burbank, Calif. • Southwestern Plant: Dallas, Tex.

Circle No. 20 on Reader Service Card.

APRIL 21, 1958

139

PEOPLE

Manufacturing

William E. Cobey will direct helicopter engrg. for Republic Aviation Corp.



COBEY



GAVIN

He is former president of Transcendental Aircraft Corp.

Lt. Gen. James M. Gavin, recently retired from the Army, becomes vp and dir. of Arthur D. Little, Inc.

Ward D. Davis, **E. Stuart Gregg Jr.**, **John W. Mazur** and **Fred P. Montanari** are named sales group mgrs. for Doman Helicopters, Inc. Davis will head special products sales div., Gregg helicopter sales, Mazur military and commercial engrg. services and Montanari will manage mfgd. products div.

R. K. Oglesbee resigned as asst. mgr.-aircraft operations, Lockheed Aircraft Corp. missiles systems div. to form a consulting firm, R. K. Oglesbee & Associates.

Pat Lynch to manage administrative sales for Aeroquip Corp.'s western div., Burbank, Calif.

Maj. Gen. Dudley D. Hale will manage The Martin Co.'s Washington, D.C. office. Hale recently retired from the Air Force.

Richard L. Spaulding appointed asst. to pres. Babb Co. Spaulding was previously an Air Force pub. rel. officer.

Raymond M. Bukaty joins Avco's



SPAULDING



BUKATY

Crosley Div. as vp-marketing.

Jack Warshauer, **J. M. Wright** and **Robert E. Peck** will take new positions with Summers Gyroscope Co. Warshauer is named exec. vp; Wright vp-customer rel., and Peck vp-operations.

Tom McCracken will coordinate long-range prod. planning for USAF's T-38 jet trainer for Northrop Div. of Northrop Aircraft, Inc.

Sherman E. Crites becomes mgr.-marketing for General Electric's Small Aircraft Engine Dept.

F. R. Crowe, **A. G. Schramm** and **W. O. Higgins** have taken new positions

with Allison Div. of General Motors. They will be asst. mgr. aircraft parts dept., commercial; asst. mgr. aircraft parts dept., military, and mgr. subcontract sales, aircraft engine operations, respectively.

James F. Healey named dir. marketing and planning and **Robert E. Clifford** appointed mgr. div. marketing for Minneapolis-Honeywell Regulator Co.

William A. Ziebell becomes plant supt. for Chicago Aerial Industries, Inc.

Transport

Edward Ringo elected exec. vp of Transocean Air Lines and bd. chrm.-Flight Enterprises, Inc., a Transocean subsidiary. Replacing Ringo as flight president will be **Donald Zipfel**. **George McCusik** succeeds Zipfel as vp.

Lee Edwards of Northwest Airlines is named chrm.-Air Safety Committee, Air Line Dispatchers Assn. Int'l.

C. F. Zimmerman elected to director's bd., National Business Aircraft Assn. He is head of Continental Oil Co.'s aviation dept.

Robin Kinkadee succeeds **Pascal Cowan** as pub. rel. mgr. of Pan American's Pacific-Alaska Div. A 10-year veteran, Cowan resigned for health reasons.

William K. Fowler, **John T. Brannigan** and **John T. Ahern** have taken sales positions with the Flying Tiger Line. Respective positions are mgr.-airmail, air express and military sales, eastern reg. sales mgr. and Dayton, Ohio sales rep. Fowler and Ahern were formerly with Slick Airways.

Patrick J. Brennan named head of Irish Air Lines' commercial div. He formerly was commercial mgr.

Robert L. West appointed dir.-advertising for Capital Airlines. He formerly handled Western Airlines' adv. account as vp-Buchanan & Co., Los Angeles. **Read Q. Chalfant** promoted to vp-traffic and sales.

J. Carl Ferrell named gen. sales mgr. for Pacific Air Lines (formerly Southwest Airways).

Miss Fran Wheeler is appointed new post of coordinator of women's services for Delta Air Lines. Her duties will be promotional.

Capt. S. G. Granger named Trans World Airlines' system dir. jet flight oper-



WHEELER



GRANGER

ations and jet planning committee. Granger is former TWA flight op'ns. dir., Paris.

Edward A. Carroll promoted to mgr. aircraft econ. analysis and **Lee R. Howard** named mgr. aircraft performance engrg. for Trans World Airlines. Howard was formerly a performance specialist with Douglas Aircraft Co.

S. Clarke Bassett appointed admin. asst. to operations mgr. of Pan American Airways' Pacific-Alaska div. He has been in aviation since 1929.

Warren F. Clark joins Northwest

Orient Airlines as New York area agency and interline sales rep.

George Sahlin, Jr. will be Pacific Northern Airlines' sales rep. in Anchorage, Alaska.

William B. Clark becomes western reg. sales mgr. for Riddle Airlines.

Government

Col. William Cowart, Jr. named director, Airways Modernization Board's National Aviation Facilities Experimentation Center at Atlantic City.

Herbert H. Howell named asst. to administrator for development of Washington Int'l Airport at Chantilly, Va. for CAA.

George R. Borsari will head CAA's Office of Airports.

Edgar N. Smith reassigned as CAA's planning and development officer.

Burleigh Putnam, former chief of General Safety Div. of CAA's Office of Flight Operations and Airworthiness, becomes deputy dir. of the office. **Ralph Lovering** will replace Putnam.

Dr. John E. Smith becomes chief-medical div. in CAA Office of Flight Safety and Airworthiness.

Henry P. Steier named special asst. for tech. info., Airways Modernization Board.

Military

Maj. Gen. Harold W. Grant replaces **Maj. Gen. Alvin L. Pachynski** as dir.-communications/electronics, hqds., USAF. Pachynski retires this summer after 31 years' service.

Lt. Gen. Frederick H. Smith, present 5th Air Force Commander in Far East, will be transferred to Commander, Air Training Command.

Col. Norman L. Peterson appointed commander, USAF Air Weather Service. He has been Deputy Commander since 1954.

Brig. Gen. M. S. White elected president of Aero Medical Assn. He is dir. medical staffing and education for USAF surgeon gen.

Brig. Gen. Henry R. Sullivan, Jr. named to command cadets at U.S. Air Force Academy. Sullivan was former commander of 72nd Bombardment Wing, SAC.

Maj. Gen. Kenneth P. Bergquist appointed ARDC deputy commander, Air Defense Systems Integration. He was former Asst. Chief of Staff, USAF Headquarters.

Brig. Gen. Ben I. Funk promoted to major general.

Honor Roll

(The following have served in aviation industry 25 years or more)

Bertram F. Ritchie, captain, Northwest Orient Airlines.

Phillip T. Sharp, salesman, San Diego, United Air Lines.

Harry V. Fuller, lead shop mechanic, San Francisco, United Air Lines.

John A. Johnson, flight engr., San Francisco, United Air Lines.

George F. Klein, dist. pass. serv. mgr., Seattle, United Air Lines.

Malcolm W. Stevenson, dist. sales mgr., Washington, D.C. United Air Lines.

I. M. Laddon, director, General Dynamics Corp.



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the science relating to the cushioning of shock on initial impact... an outstanding advancement that brings aircraft seating in pace with the jet age.

Aerotherm, originally commissioned to initiate the study of E A, has made significant progress in the field. This principle is now utilized in the production of seats for jet age aircraft.

It is only natural that Aerotherm, manufacturers of the finest aircraft seats in the world, should pioneer in this field.

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Manufacturers Plainfield, Conn.





FASTER FARTHER HIGHER

One of the world's most modern high performance air-to-air guided missiles, the SPARROW II, is going into production at Canadair for the Air Defence Command of the Royal Canadian Air Force.

The SPARROW II is rocket powered, flies at several times the speed of sound, and employs a completely self-contained radar seeking system. Its combination of speed, manoeuvrability, and accuracy ranks it a match for any present manned operational aircraft.

Canadair as co-ordinating contractor, has overall responsibility for manufacture, assembly and flight testing. In producing the SPARROW II's Canadair will work in close collaboration with Canadian Westinghouse Company Limited as associate contractor, and with the R.C.A.F. and the Department of Defence Production, as well as with the original designer of the missile, Douglas Aircraft Company Inc.

This trust has been placed with Canadair because of the company's extensive experience in guided missile development, and its long record in advanced aircraft systems engineering.



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AIRTRENDS

Source Selection Board recommendations on three USAF projects will be submitted to the Air Staff Apr. 22. They cover the big orbital bomber (Dynasoar project) and two off-the-shelf utility jet aircraft—UCX and UTX. Decisions should be forthcoming soon.

Dynasoar is biggest and most important project. More than \$1 billion is said to be available. Leading contenders: Martin, which is hooked up with Bell Aircraft (which did original USAF research) and American Machine & Foundry, among others; Boeing, tied in with Chance Vought and North American's Rocketdyne division. A number of other combinations have submitted proposals.

Indications are that Dynasoar will be awarded to a "team" on the theory that the project is too big and requires too many diverse skills to warrant single-contractor handling.

Navy and Army have revealed their aircraft buying plans. Navy expects to order 707 new planes in fiscal 1959, compared with 898 in fiscal 1958. Latter figure is a big cut from 1,220 planes contained in fiscal 1958 budget hearings. Delivery schedule has also been reduced to 1,715 aircraft in 1958 and 1,273 in 1959.

Here's what Navy will buy in fiscal 1959: Grumman A2F-1 long-range low-level attack plane; Grumman carrier-based W2F-1; Lockheed C-130 for in-flight refueling and for Marine troop-cargo transport; improved version of ASW patrol aircraft. Procurement of Sikorsky ASW helicopter, Grumman S2F-3 Tracer and Martin P6M SeaMaster will continue.

Army's fiscal 1959 buying list includes 24 three-ton payload cargo helicopters; 60 ¾-ton payload utility helicopters; 176 two-passenger reconnaissance helicopters; 31 two-passenger observation planes; 100 ½-ton payload utility aircraft; 29 1½-ton payload cargo planes.

TRANSPORT

Domestic airline traffic in March dipped below the same 1957 month. Reasons: Economic recession, extreme weather conditions in eastern U.S., poor Florida winter season, Western Air Lines' strike. March passenger-miles totaled 2 billion, or 0.2% under same month last year. Passenger load factor of 58.6% was down 2.14 points—the sixth consecutive month in which trunkline load factors were less than 59%. In 21 of past 24 months, a load factor drop below that of the same month the preceding year has been recorded.

It will be some time before Capital, Delta, TWA and Northwest can open new routes to Florida. CAB awards in Great Lakes-Florida case were in press release decision. Because of complexity of case, issuance of formal Board order is many weeks away. Carriers may not want to start service until fall travel season starts anyway, and may be delayed that long before they have facilities lined up at new cities.

Local service lines have sidetracked a proposal for a central overhaul-repair facility for Rolls-Royce Dart engines powering their Fairchild F-27s. Project probably won't be reinstated. It became less attractive when some lines switched to larger Darts. Much bigger investment would have been necessary to handle two types. Also, there's no lack of contract sources: Pacific Airmotive, Utica Bend Div. of Curtiss-Wright, C-W's Caldwell-Wright Div. at North Hollywood. Continental Air Lines, which is installing its own turboprop overhaul facility at Denver, is also a possibility. One line plans to send engines to Rolls-Royce in Montreal for overhaul.

Several companies have been invited by Allison Division of General Motors to bid on the Allison-Convair 340/440 turboprop conversion. They include Convair, Ryan, Republic, Temco, North American-Columbus and Pac Aero Engineering Corp. Cost of conversion is estimated at \$480,000, of which \$230,000 is for engines and props. This is without allowance for resale value of piston engines and props.

INDUSTRY At Deadline

AT ALTA meeting

CAB okays first loan for locals

by Fred S. Hunter

LAS VEGAS, NEV.—Stature of the local service carriers is improving, and the future is taking on rosier hues.

"We may not have it made, but it now looks as though we had a chance," observed one executive here during the meeting of the Association of Local and Territorial Airlines.

Big news at the session was the announcement that the CAB had approved its first loan under the Guaranteed Loan Act of 1957. This legislation had been actively supported by one-year old ALTA, and the announcement that one of its members, Bonanza Air Lines, was the first beneficiary gave the group a significant lift.

The announcement was given considerable emphasis by the fact that it was made here to ALTA in person by James R. Durfee, CAB chairman, during a luncheon at which he was the speaker. Also fitting was the fact that Bonanza was the host airline at the ALTA session.

The guarantee given the CAB's first O.K. is for 90% of a \$4,324,500 loan by the First National Bank of

Nevada to Bonanza for the purchase of six Fairchild F-27 turboprops. The planes are scheduled for delivery in December.

Further evidence that the prestige of the smaller carriers is on the upgrade was the attendance of a number of industry representatives. This was ALTA's first venture in making time available to industry representatives and it turned out to be so successful that Executive Director Joseph P. Adams said the procedure would be repeated at subsequent meetings.

Fairchild Engine & Airplane Corp., which has sold F-27s to several local carriers, had the biggest delegation and was host at a luncheon where Richard S. Boutelle, company president, revealed the roll-out of the first production airplane in accepted Las Vegas style—with girls carrying banners proclaiming "It's Here!"

Others in the Fairchild group were R. James Pfeffer, executive director-customer relations; Marion Maxwell, asst. director-customer relations; W. H. Arata, chief project engineer,

and Lou W. Davis, assistant to the president.

Other companies making presentations at the meeting included: Convair, Douglas, Lockheed, Allison, Curtiss-Wright, Canadair, Napier, AirResearch Aviation Service Co., Burns Aero Seat, Pacific Airmotive, and TECO, Inc.

Growing importance of the local service carriers in the equipment market was illustrated by the turboprop presentations made by Fairchild, Allison, Canadair and Napier. No one came up with a proposal for straight jets, but there were hints both from Convair and Douglas.

Allison put on an impressive show by dispatching its Convair YC-131C from Indianapolis to provide demonstration flights for the ALTA delegates.

Canadair and Napier teamed up to present a report on the Eland-powered Convaers, which may be obtained in the new Model 540 (Eland version of the 440) from Canadair or in conversions of present 340s or 440s.

Napier reported it expects to complete CAA certification of its Eland-Convair not later than July. Canadair has not fixed price of a Model 540, but it is expected to be approximately \$1.1 million, ALTA delegates were advised.

Conversion of a piston-powered Convair 340 to Eland turboprops will cost \$430,000 in the U.S. Napier put operating cost for a 200-mile stage length at \$160 per hour, or 69¢ per mile. Standard versions of Eland-Convaers will have 44 or 48 seats, but capacity can be increased to 52, 54 or even 60.

Although Fairchild selected a seat designed by the Aerosmith division of L. B. Smith Aircraft Corp. for the F-27, the ALTA meeting revealed that competition for the turboprop seat business is now at hand. Both Burns Aero Seat and TECO, Inc. had newly developed lightweight seats on hand to demonstrate to the locals.

Western signs with FEIA

Western Air Lines, in a recent pact with the Flight Engineers International Assn., agreed to reserve the "third seat" in the cockpit of future WAL airliners for a flight engineer.

The contract, not due to expire until January 1, 1959, was reopened by mutual consent of both parties. New agreement gives the flight engineers about 15% in wage increases, effective next Jan. 1.

Included also in the contract is a scope clause extending into jet operations, and a requirement that the flight engineer possess an A&E mechanic's license. The agreement extends to Jan. 1, 1961.

Increases in maximum monthly earnings for the WAL engineers aboard DC-6Bs go from \$864/mo. up to \$1007/mo., as of January 1, 1959, and engineers aboard the company's Lockheed Electras will earn \$1,164 per month.

Parrish names Day assistant publisher of American Aviation

Hugh A. Day, who joined American Aviation Publications last year after serving as director of Air Force's New York Office of Information Services, has been appointed assistant publisher of AMERICAN AVIATION magazine, Wayne W. Parrish, president and publisher, has announced.

Day's previous assignment with AAP has been as advertising manager of *Armed Forces Management* and *Air Cargo*. He will transfer from New York to Washington.

The new assistant publisher served as a lieutenant colonel with USAF. Prior to returning to active duty in 1951, he had been eastern sales director of National Broadcasting Company's film department and for several years before that was an advertising

manager and space salesman.

Two other assistant publishers also have been appointed in a major reorganization of AAP's management structure:

C. A. Hurt becomes assistant publisher of *Missiles and Rockets* magazine, which will switch from monthly to weekly frequency July 1. He previously was assistant publisher of *Tooling and Production*, a Huebner publication.

Thomas S. Miles has been named assistant publisher-administrative. He previously was director of AAP's Air Information Services. In his new position, Miles will coordinate activities of various service departments of the company.

M. Michael Cerick, who has been advertising sales manager of AMERICAN AVIATION, has been appointed advertising sales manager for *Armed Forces Management*, *Air Cargo* and *World Aviation Directory*. He will remain in the New York offices of AAP.



DAY

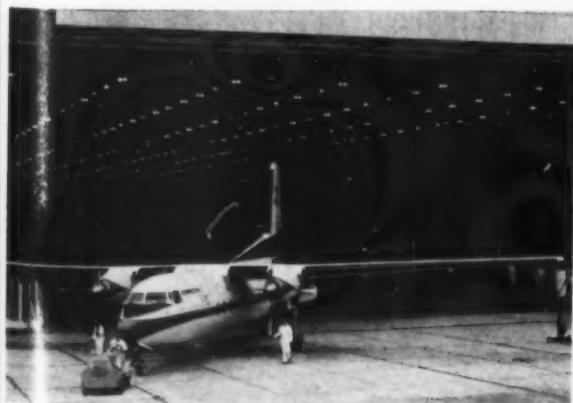


FIRST F-27 off the Fairchild assembly line rolls out at Hagerstown, Md.

Fairchild rolls out F-27, starts flight tests

BIG DAY at Hagerstown, Md., was April 10, when Fairchild Aircraft Division rolled out its F-27 twin-turboprop and immediately began initial flight-testing. Powered by two Rolls-Royce Dart RDa.6 turbines driving Rotol propellers, the F-27 is being offered both as a 40-passenger local service airline transport and as an executive aircraft. Fairchild reports 95 orders to date from 14 airlines and 13 other corporations. First airline delivery is slated for late June, when West Coast Airlines will get the first of six it has on order. Among recent corporation orders notched by Fairchild was that of Champion Spark Plug Co. for a single F-27.

THREE more F-27s near rollout on the final assembly line.



LONG wing-span of F-27 is emphasized in this rollout picture.

APRIL 21, 1958

NEW TOOL

FOR THE ALL-JET

AIR FORCE!



Cessna's T-37 jet trainer, now in operation,
combines outstanding high-altitude performance
with unique side-by-side instruction,
high to low speeds, easy handling
...fits the new concept in USAF training:
a quicker, safer transition
into combat jets!
Cadets learn faster,
USAF realizes time-money savings.



CESSNA AIRCRAFT CO., Wichita, Kans.

Domestic no-show plan faces oblivion—or revision

The domestic airlines' year-old no-show control plan may be abandoned or softened.

American Airlines astonished the industry this month by revealing at an Air Traffic Conference meeting in Washington that it would not vote for continuing the plan. One negative vote kills the program, which includes minimum time limits on ticket pickup and reconfirmation and assesses the \$3 no-show penalty.

As a result, a special ATC meeting will be held in Washington May 13 to decide the plan's future. Unless some action is taken, it will expire Sept. 1.

AA's opposition came as a surprise because the company had spearheaded the drive for the plan's adoption at the April 1957 ATC meeting in New Orleans.

At that time, expiration date was set for 90 days following the 1958 spring ATC meeting, so there would be an orderly method of discontinuing the plan if studies showed results did not justify the costs involved.

AA says its studies show that administrative costs are too high, that passengers are being inconvenienced. It has proposed certain alternatives that would soften the rules. These proposals, together with those of other carriers, are expected to be considered at the May 13 session.

How CAB will react to abandonment or softening of the plan remains to be seen. In 1956, CAB Chairman James R. Durfee told the industry that it can and should settle this (no-show) problem by itself, rather than force the Board to take steps seeking a solution.

Pennsylvania firm acquires Aero Design

Board of directors of Aero Design & Engineering Co., Bethany, Okla. has reached agreement with Rockwell Spring and Axle Co. of Coraopolis, Pa. under which latter acquires Aero Design as an operating subsidiary. Transaction requires approval by stockholder groups and is subject to a registration statement with SEC before becoming effective.

George T. Pew, Aero Design board chairman and president, termed the agreement a forward step which would provide greater possibilities for growth and expansion. He said Aero Design will maintain a separate corporate entity and that the agreement contemplated that the existing management group would remain in charge.

Rockwell is a major automotive industry parts supplier. Its gross sales last year were in excess of \$280 million. Aero Design, manufacturer of the twin-engine Aero Commander executive transport and its military counterpart, the L-26, had sales approximating \$14 million.

What's behind Defense reorganization battle?

Battle lines were being drawn last week for what appears to be a fight to the finish over President Eisenhower's plan to "unify" the Defense Dept.

Biggest issue: The demand that the Secretary of Defense take over complete control of the Defense budget, or be provided the right to transfer funds within or between the services.

Congress traditionally has been jealous of its constitutional budget-making authority and always has denied the President authority to "line veto" individual appropriations items.

However, Congress has given the Budget Bureau authority to apportion appropriated funds. This has meant, in a few cases, that by failing to apportion funds Budget Bureau has effectively

blocked the obligation of money for programs approved by Congress.

Behind the tactical by-play in the brewing battle is the very real fear of some service advocates that power of the checkbook will be used to force unification without approval of Congress.

Other major reorganization issues:

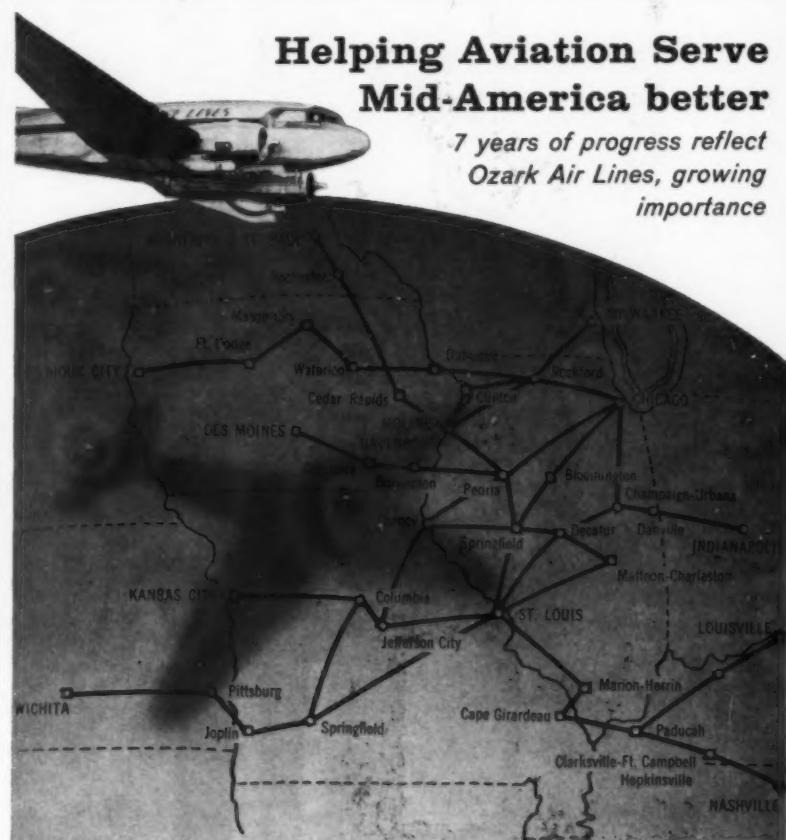
- Continuation of the Joint Chiefs of Staff as a four-man corporate body acting through Secretary of Defense.

- Elimination of the Secretaries of the Army, Navy and Air Force from the chain of command, leaving three services in an "agency" capacity under the control of the Secretary of Defense.

- Failure to eliminate what many members of Congress consider too many assistant defense secretaries.

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7 years of progress reflect Ozark Air Lines, growing importance



Adding more flights . . . serving more cities . . . modifying its fleet for still greater safety, comfort, and economy . . . all are a part of the progress at Ozark during the past seven years. Much of this progress was in the year just past. The number of passengers flown increased 25 per cent in 1957. More than 6,000,000 miles were flown, exceeding 1956 mileage by 23 per cent. Ozark flew air express and air freight last year, too . . . and carried well over 4,000,000 pounds. New routes include service to Cedar Rapids, Rochester, and Minneapolis-St. Paul. Working closely with connecting air lines, Ozark's constant endeavor is to bring better service to its cities and passengers.

OZARK AIR LINES

THE BUSINESSMAN'S AIR LINE SERVING MID-AMERICA

General Offices: Lambert Field, St. Louis, Missouri

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NEW GRUMMAN



CONTAINER LOWERS AIR FREIGHT COSTS

Aluminum containers, designed and built by Aerobilt, a Grumman subsidiary, now enable American Airlines to lower air freight costs and standardize shipping methods throughout their routes. On-route tests prove that the lightweight Aerobilt containers save air freight carriers money by minimizing cargo handling and lowering claims from pilferage and damage. These tests also prove that Grumman's unique container design provides an extremely high payload per container plus the ruggedness to stand up under the roughest handling.

This completely weatherproof Aerobilt Container weighs only 203 pounds and carries a payload of 3,000 pounds. It has withstood static tests of a 3,750 pound overload plus 1,500 pounds on top without any injury to the container. The container is 84" long, 63" high and 42" wide and has a full-length hinged door which can be locked and sealed.

For more information about the variety of Aerobilt Containers to meet your specific cargo handling needs, for air, land or sea, contact
Mr. George Skurla, Chief Engineer,
Aerobilt Bodies, Inc.



MAJOR INTERNATIONAL CARRIERS SELECT



LORAN

FOR JET-AGE LONG RANGE NAVIGATION

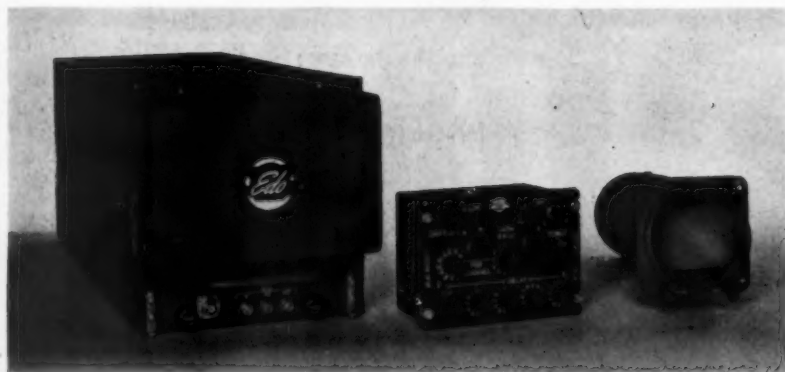


LORAN has long been recognized as the reliable, highly accurate system of long range navigation. LORAN is already implemented and in service over North Atlantic and Pacific air routes, with immediate expansion planned to cover other important areas, too.

Now, LORAN becomes an even more practical navigation system, with the development by Edo of a simplified, lightweight, *pilot-operated* unit. This compact equipment, weighing only 26 pounds installed, can be mounted in the cockpit.

From it the pilot obtains directly read line-of-position information, without having to consult tables or make complicated calculations.

Thoroughly tested in trans-oceanic operation, Edo LORAN has been ordered by Pan American World Airways, BOAC, Qantas and Cubana for installation in their upcoming fleets of Boeing and Douglas jet aircraft. Many other international carriers have also indicated their intention to use LORAN to assure precise, reliable long range navigation.



EDO AIRBORNE LORAN, Model 345

Control panel and 3-inch scope are mounted in cockpit for operation by pilot or co-pilot. Receiver (left) occupies $\frac{1}{4}$ ATR rack. Installed weight of complete system is only 26 lbs., and compact unit requires only a small fraction of space formerly required. Designed and manufactured by Edo, a major supplier of advanced electronic systems for the U.S. Navy — sonar, radar, ASW equipment.

For the complete data on Edo Model 345 Airborne Loran, send for Technical Manual #501, Dept. L-5.

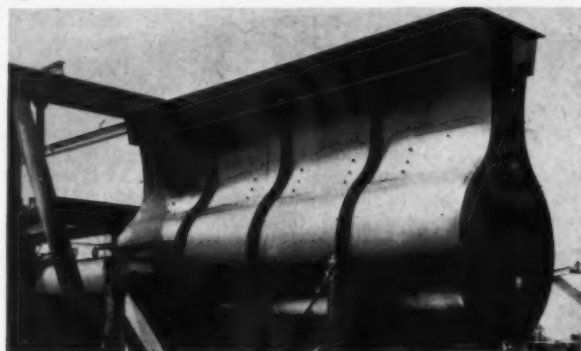


EDO Corporation

College Point, Long Island, New York

Manufacturers of a Trustful Line of Marine and Airborne Electronic Equipments

What's new in jet ground handling equipment



SOUND SUPPRESSION RIVALRY STARTS TO RUMBLE. Two new portable jet engine sound suppressors are being demonstrated in a field which rapidly is becoming highly competitive. Model XD-2 by Koppers Co., Baltimore, is said to reduce noise level by as much as 35 decibels and has been undergoing tests at the Naval Air Station, Patuxent River, Md. General Sound Control's Model 818 (right), in use at Douglas Aircraft Co., is designed to withstand operating temperatures of 1,100°F without using cooling water. These silencers are typical of those which will be required by airlines during airport maintenance operations.



HEAVYWEIGHTS PRACTICE ART OF GENTLE PERSUASION. Two large tractors, recently introduced as answers to the question of how to move large jet aircraft, are said to feature very sensitive control for accurate positioning. Silent Hoist & Crane Co.'s Towkar Model TK30 (left) is powered by a 260-hp gasoline or diesel engine and is capable of a 30,000-lbs. drawbar pull. The Brooklyn company says its Towkar will move transport aircraft at speeds up to 26 mph. Clarktor 330 "Jetow" (right) by Clark Equipment Co. has up to 33,000 lbs. drawbar pull using a 272-hp, six cyl. Hercules gasoline engine. Jetow has pulled a B-52 at 5 mph and can travel at more than 18 mph without a load. Both vehicles are equipped with torque converter drive.

--- April 15 Situation Report ---

General passenger fare investigation

This day

Eastern Airlines witness Campo is again on the stand. CAB Bureau of Air Operations Counsel has been grilling Eastern's witnesses for more than a week now, and tempers are frayed.

Ahead

... are several more weeks of this ... a 10-day recess ... then presentation by the Bureau ... rebuttal testimony and final argument. Hope is that this investigative phase will end before the August vacation shutdown. For all signs point to a nine-months gestation period while Examiner Wiser develops his conclusions and recommendations, and the CAB bestirs itself to a long-awaited, anti-climatic ruling.

Behind

... are nearly two years of investigative effort ... 91 working days of public hearings ... 8,935 pages of transcript ... hundreds of detailed exhibits.



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New, rigid oxygen rules proposed for jets

CAB at long last has tackled several of the real controversial questions dealing with oxygen and high-flying jet operations: How much oxygen must the airlines carry and how must it be "served."

In a draft regulation (58-7) requiring industry comment no later than May 5, the Board's Bureau of Safety proposed these new rules for operations at altitudes over 25,000 ft.:

Passenger briefing—Before flight above 25,000 ft., a crew member shall instruct passengers on the location and operation of oxygen equipment and on

the need to use it in event of cabin depressurization.

Pilot oxygen—One pilot must wear and use an oxygen mask at all times (above 25,000 ft.) unless it can be shown that a mask can be worn in such a way that it can be put on with one hand while maintaining control of the aircraft.

It is expected that crew oxygen rules will be most controversial on jets, since military experience has shown that, in a series of decompressions at 26,000 to 39,000 ft., at least one crew member became unconscious in each

instance despite having prior training and a mask at the side of his face.

Passenger equipment—An oxygen dispenser shall be immediately and automatically available to each passenger, wherever seated, and not less than two dispensers located in each lavatory.

Cabin attendants—A portable oxygen supply must be carried by each stewardess during the entire flight above 25,000 ft. unless an airline can show that sufficient spare outlets and masks are distributed throughout the cabin and immediately available to attendants in event of depressurization.

The proposal also would require a visual and aural signal for the pilot or flight engineer whenever safe limits for cabin pressure differential, absolute pressure or rate of change of absolute pressure are exceeded.

Another set of indicators would be required to inform the crew whether oxygen is being delivered to each user and also whether the automatic presentation system for passengers is operating properly.

TWA gets go-ahead on 'Siesta' service

Civil Aeronautics Board Examiner Richard A. Walsh has recommended approval of Trans World Airlines' "Siesta Sleeper Seat Service." Walsh said he could find no evidence that the siesta service would result in a "deterioration of the first-class service in domestic" markets.

The Board has been investigating the fares charged by TWA for its new de luxe service in which 32 sleeper seats were substituted for the 44 standard seats in the first-class compartment of Lockheed 1649A aircraft.

Walsh expressed the opinion that TWA, by its new plan, "was not engaged in a so-called give-away race which threatens to undermine the air transport industry" . . . but rather attempting to obtain more traffic for and more revenues from existing flights in order to improve its earnings."

Under the examiner's proposal, the Board would be allowed, as a safeguard, to reopen the record to reappraise the new service.

Northeast nears deadline on Britannia decision

The Bristol Britannia 305 turbo-prop transport has been certificated by the CAA.

Northeast Airlines, which had ordered five of the British planes, had stated that it would not be interested in the Britannia unless it was certificated by May 1.

Northeast must also arrange financing, and has 60 days from the date of certification (April 10) to see if it can find the funds to consummate the purchase.

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The remodelling of the TCA fleet has already begun. In 1955, TCA introduced the now famous Viscount, and became the first airline in North America to fly prop-jet aircraft.

An order has been placed for 20 Vickers Vanguard airliners, powered by Rolls-Royce Tyne prop-jet engines. Seating up to 96 passengers and flying at 420 miles per hour, the Vanguard will serve TCA's high-density inter-city and Southern routes. The Viscount, likely to be the best short-range aircraft for many years, will continue to serve short-range routes.

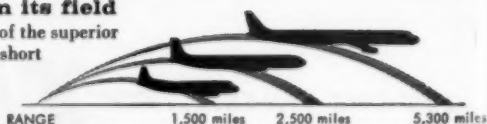
Giant Douglas DC-8 jetliners will round out TCA's re-equipment programme. Cruising at 550 miles per hour, carrying up to 134 passengers, they will cut flying times on trans-Continental and trans-Atlantic services by almost half.

The composition of this future fleet has been determined after years of exhaustive study and evaluation. It represents a balanced combination of aircraft best able to fulfill TCA's particular route requirements.



Three fine aircraft . . . each ahead in its field

In the Vanguard and Viscount, advantage will be taken of the superior operating qualities of prop-jet aircraft over medium and short distances. The turbo-jet DC-8, with its higher speed, will realize its full potential on TCA's long distance routes.



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Slick offers program to 'save' cargo industry

Slick Airways has called on Civil Aeronautics Board for subsidy in order to get common carrier airfreight operations restored. The scheduled all-cargo airline, which has already suspended all common carrier operations, made it clear that it was not seeking subsidy relief to recoup losses of the past.

The Slick petition spelled out to CAB a seven-point "positive" program for relief of the all-cargo industry. According to Slick, the Board should:

- Start an investigation "at the Board's earliest convenience" of airfreight rates and the air rate structure.

- Make a decision in the Intra-Area Cargo Case (Docket No. 9258) "without delay."

- Urge Congress and the Defense Department to "make any legal or policy adjustments required for maximum utilization by the military agencies of the common carrier and charter services of the civilian industry."

- Review the volume of military charters and the contract awards to see if they have not dropped below the break-even point for the industry.

- Consider again whether it might not be better to issue permanent certificates to the all-cargo carriers.

- Ask Congress to make all-cargo carriers eligible for government-guaranteed equipment loans.

- Set up a staff to continuously review "the progress of the all-cargo carriers during the period of their recovery."

Puerto Rico objects to increase in fares

Puerto Rico has objected strenuously to any increase in airline passenger fares. Both Pan American World Airways and Eastern Air Lines have filed increased tariffs in the New York-San Juan and Miami-San Juan markets.

A Commonwealth of Puerto Rico complaint has informed Civil Aeronautics Board that the PAA-EAL fare hike represents the same as that used in the interim fare increase granted domestic carriers in February (4% + \$1).

Puerto Rico also maintains that the San Juan-Mainland fares currently provide the carriers with a "handsome return" on their investment. "There is no need for increased profits on this lucrative segment," it said. "On the other hand," the complaint continues, "the revised tariffs could seriously prejudice the people of Puerto Rico by retarding the economic development of the Commonwealth."

CAB proposes easing rules on equipment sales

A new Civil Aeronautics Board proposal would give airlines a free hand to sell or lease their aircraft in limited quantities. The proposal is contained in the form of an amendment to Economic Regulations of the Board.

Under existing rules, prior CAB

approval is required for any "substantial" sale or lease of equipment by the airlines. The amendment would abolish the need for approval in transactions involving one to five aircraft—or less than 20% of a certificated carrier's fleet—or "where no substantial public interest problem is involved" for other carriers. The airlines would still be required to report any sale or lease.

The proposed rule appears in the April 10 Federal Register, and the secretary of Civil Aeronautics Board, Washington 25, D.C., will accept quadruplicate comments until May 9.

CAA seeks pilots' opinions on runway floodlights

Pilots of airline, military and business aircraft have been asked by CAA

to comment freely on a new floodlighting installation on Washington National Airport's ILS runway.

Special forms have been mailed to about 2,000 representative pilots with a request that they be completed and returned unsigned. CAA wants opinions, not names, and hopes that this type of in-service evaluation by "users" will result in a national standard for all-weather runway lighting.

Installation at Washington consists of a row of lights extending for 1,300 feet along each side of the approach end of the runway. Concentrating reflectors throw the light close to the surface of the runway. A new type of painted-strip marking plan is being evaluated along with the floodlighting, and eight different paints are being used in the tests.

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CAA announces list of airport aid projects

Civil Aeronautics Administration has released a list of 358 airport construction and improvement projects programmed for fiscal 1959 under the Federal Aid Airport Program. Federal grants have been authorized totaling \$63,566,135, which represents approximately half the total cost of the projects.

This is the largest sum committed for any single fiscal period since the program began in 1947. Also, after June 30, 1958, when recapture of uncommitted fiscal 1957 funds is accomplished, it will be the first time that the annual \$63-million budget for the airport program has been stabilized.

The recapture clause in the aid program requires that all funds allocated in any fiscal year be committed for CAA-approved projects during that period or the year following. Any funds not committed are returned to the CAA for re-allocation to other projects.

Of the total allocated for fiscal 1959, \$3,050,000 will be expended on 17 airport projects in Alaska, Hawaii and Puerto Rico, while the balance will be spent on projects in the continental U.S.

Under-Secretary of Commerce Louis S. Rothschild said the present program should assure management and labor that more employment opportunities are ahead, both in the production of materials and the actual construction involved in the projects.

Airlines approve Chicago's plans for O'Hare airport

Scheduled airlines have approved Chicago's proposed plan for jet development at O'Hare International Airport. With agreement on a money figure and completion of architectural plans, contracts on the airport's modification could go out this year, according to George De Ment, Chicago's public works commissioner.

Only qualifications to airlines' approval were: Results of Civil Aeronautics Administration air traffic studies of the plan; maximum use of existing O'Hare facilities; agreement must be reached on cost; agreement must be reached on "priority and staging of construction."

Most recent cost estimate is \$130 million. Airline standards indicate this is "much too high" and suggest \$85 million. Compromise at about \$100 million is expected.

Reorganization of MATS to be completed July 1

Reorganization within the Military Air Transport Service Command will take place in connection with the transfer of MATS' Continental division, now located at Kelly AFB, San Antonio, Tex., to Travis AFB, San Fran-

cisco. The Kelly contingent, when it moves to California, will take on the functions of the Pacific division.

The move will be completed about July 1, when the Continental division will be redesignated the Western Transport Air Force, and MATS' Atlantic division, based at McGuire AFB, Wrightstown, N.J., will be redesignated the Eastern Transport Air Force.

MATS' Pacific division, now located at Clark AFB, Philippine Islands, will be inactivated when its functions are assumed by Continental.

During 1957 MATS flew 2,472,996,483 passenger-nautical miles, 274,777,387 passenger-ton-miles and 507,231,630 cargo-mail-ton miles. Most re-

cent spotcheck (last six months, calendar '57) showed 36% of passengers and 6% of cargo lifted by MATS were hauled by commercial carriers.

Single-manager concept applied to military traffic

A new Dept. of Defense regulation combines all the service regulations governing procurement and use of commercial transportation of passengers and freight by the military departments within the U.S.

The regulation places responsibility on a single manager, the director of the Military Traffic Management Agency.

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BOAC rolls out Comet 4, gets new orders



FIRST OF BOAC's nineteen Comet 4 jet transports recently rolled out at de Havilland Aircraft Co.'s Hatfield (England) plant to begin a series of fuel-flow checks and engine runs. British manufacturer, almost simultaneously with rollout, announced new orders for Comets, six from British European Airways and at least six from Aerolineas Argentinas, at a combined value approaching \$40 million. Comet is powered by four 10,500-lb. thrust Rolls-Royce Avon jets fitted with noise suppressors.

IAM wins 25c boost for Republic workers

First major aircraft manufacturer to sign a new labor agreement this year is Republic Aviation Corp.

Terms were reached with International Assn. of Machinists after federal mediators had moved in and averted a threatened strike. Agreement calls for immediate boosts of 10¢ to 14¢ an hour for 6,300 workers whose

present wages range from \$1.76 to \$2.75.

The overall package increase is estimated to be 25¢ per hr., which includes a cost-of-living escalator. Agreement also provides an additional 2¢ for nightshift assignments and an automatic 10¢ increase starting next April 1.

Rothschild and senators clash on airport aid

The Eisenhower Administration and Senate Aviation subcommittee members locked horns at presstime in debate as to whether the government should underwrite more aid to airports via an extension of the Federal Airport Aid Act.

Undersecretary of Commerce for Transportation Louis Rothschild told the Senate group that airports are community assets attracting business and tax income to the communities they serve. He contended that, as business enterprises, airports should draw support from the commercial air carriers, business and private pilots who use them.

Subcommittee Chairman Sen. A. S. Monroney (D-Okla.) said he was terribly disappointed that Commerce thought the smaller, poorer localities should conduct airport programs with "do it yourself kits." Sen. Frederick G. Payne (R-Me.) agreed with Monroney and urged that the subcommittee not only consider the more immediate needs of large terminals, but also those of smaller airports.

The new airport aid bill would increase from \$63 million to \$100 million the Federal funds obligated annually for airport aid beginning in fiscal 1959. It also would authorize immediate emergency funds of \$75 million.

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Tasman ready to buy fleet of Electras

Tasman Empire Airways, Ltd., of Australia and New Zealand reportedly has selected the Lockheed Electra over the deHavilland Comet 4 for its re-equipment program. Company will spend about \$9 million for the aircraft, but the number of planes involved was not disclosed.

Meanwhile, Ansett-Ana and Trans-Australia Airlines are bitterly opposing a government decree that they purchase British-built equipment. Ansett wants Electras, Trans-Australia favors the French Caravelle.

BOAC plans to sell Stratocruisers to Boeing

British Overseas Airways Corp. says it will sell back to Boeing Airplane Co. 14 of its fleet of 16 Stratocruisers, with delivery beginning at the end of this year.

Resale of the Stratocruisers is not connected with BOAC's purchase of 15 Boeing 707 jet transports, officials of the airline said. Boeing has not indicated what it will do with the returned aircraft.

Vertol VTOL nears first transition flight

Vertol's Model 76 tilt-wing VTOL is expected to complete 50-hr. tie-down testing this week. After this, work will start on transitioning from vertical to horizontal flight.

Vertol plans to accomplish transition by the end of this month. The aircraft already has demonstrated hovering and horizontal flight successfully.

NWA ready to buy jets

Northwest Airlines, last of the major trunks to reach a decision on turbine-powered aircraft, says it will order jets during the second quarter of this year.

NWA says "good delivery positions for medium and long-range jets are available to the company in 1960."

BOOKS

Man Unafraid. By Stephen F. Tillman. Published by the Army Times Publishing Co., Washington, D.C. 228 pp., illustrated. Price, \$4.

When the Wright brothers demonstrated their historic flying machine to Army officers at Fort Myer, Va. Sept. 3, 1908, Stephen F. Tillman, then a boy of 8, was there. Now a veteran of two world wars and a columnist for the *Army-Navy-Air Force Register*, Tillman has written an absorbing account of the early days of military aviation, covering the period 1907-1916, based in part on the scrapbook he started nearly 40 years ago. —BB.



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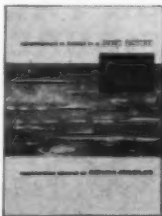
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BRIEFS

Manufacturing-military

Army's stepped-up aircraft procurement plans include orders for the Grumman Mohawk AO-1 twin turboprop observation/utility plane and the Bell HU-1 (H-40) helicopter. Army will stop buying older planes as purchase requirements are met.

Beech Aircraft Corp. is optimistic on sales for 1958, expects they'll top all of past 25 years except 1957 and, of course, the war years. Company sales in 1957 were nearly \$104 million. Sales for 1958 are expected to be about \$96 million, with about 40% of the volume being commercial, the rest government.

General Electric Co., Gas Turbine Division, received a \$17-million USAF contract for advanced product improvement program on the J79 engine.

Taylorcraft Inc. is moving its main plant from Conway, Pa., to the Connellsville, Pa., airport, 37 miles south-east of Pittsburgh.

Japanese Defense Agency has chosen the Grumman F11F-1F Super Tiger for use by Japan's Air Self-Defense Force, following a two-year

evaluation of U.S. contenders. Decision awaits confirmation by Japanese National Defense Council before a joint U.S.-Japan program is initiated calling for production of 300 planes during 1959-62.

Westinghouse Electric Corp. moved its defense products headquarters from Pittsburgh to 1000 Connecticut Ave., Washington, D.C.

Air Logistics Corp. unveiled its Pilot Tug vehicle for moving big commercial and military jets by friction of its wheels against the airplane's tires (See photo, p. 43).

Vertol Aircraft of Canada sold three Model 44 helicopters to the Canadian government for \$1 million, including spares. The rotorcraft will go to the RCAF which will turn them over to Spartan Air Services for use in supply support of the Mid-Canada Early Warning Line.

Convair has established the M-2 Club for persons who have flown faster than Mach 2 in Convair aircraft.

Craig Systems, Inc. has moved its operations to 360 Merrimack St., Lawrence, Mass. Santa Monica Aviation, Inc. is marketing a \$346 flush-antenna kit for Aero Commanders.

Navy will use Douglas A3D Sky-

warrior to test-fire new Martin Bullpup air-to-surface close-support missile. First public showing of Bullpup firing from A3D took place during Navy's annual firepower demonstration last week at El Centro, Calif.

Big seaplane modification program is planned for fiscal 1959, if Congress provides the funds. Navy feels strongly that need for multi-engine seaplanes will remain for some time.

Transport

CAB denied Pan American World Airways' petition for reconsideration of the Board's decision last year, turning down PAA for a Great Circle route from Portland/Seattle to Tokyo.

British Air Registration Board increased between-overhaul period for the Bristol Proteus 705 turboprop engines in BOAC's Britannias to 1,300 hours. Overhaul life was 500 hrs. when planes started scheduled service 13 months ago.

Airways Modernization Board awarded a \$1,877,000 contract to Aircraft Armaments Inc., Cockeysville, Md., for development of an electronic air traffic control simulator, to be completed next year.

President Eisenhower signed the

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airline capital gains bill that allows subsidized air carriers to apply proceeds from the sale of surplus aircraft to new equipment without subsidy penalties. Bill also bars CAB from considering capital losses in determining subsidy payments.

Civil Aeronautics Board has acted to approve a 6% increase in passenger fares from West Coast to Hawaii. United, Pan American and Northwest airlines have all filed for the increase, which amounts to \$10 for a one-way first-class flight.

Eastern Air Lines has named a new vice president and two new assistant vice presidents in what Capt. Eddie Rickenbacker, board chairman, described as a move to cope with "the toughest battle Eastern has ever faced to protect the traffic and the routes it has pioneered and developed now being handed over indiscriminately to other carriers by the CAB." New vice president-flight operations is Capt. John Halliburton, 27-year veteran with the airline and formerly operations manager. Charles A. Glover becomes asst. vp-interline sales and Harrison Knapp becomes asst. vp-federal and state regulatory matters.

CAB has flatly denied Air Transport Assn.'s bid for delay of compliance date by which transports approved for operations over 25,000 ft. must carry flight recorders. ATA claimed present recorders have serious shortcomings. Gist of CAB denial was that they may cost carriers money, but they are better than nothing, particularly for accident investigation during early stages of jet operation. Docket No. is 9327.

Airports

City of St. Louis, two of its suburbs and the McDonnell Aircraft Corp. filed suit in local county court to restrain the town of Berkeley, Mo. from annexing Lambert-St. Louis Municipal Airport and its \$194,000 in annual tax revenue. Suits are due to be heard in St. Louis County Circuit Court May 6.

Air Force orders more two-place F-101Bs

A \$58,140,000 contract has been awarded by USAF to McDonnell Aircraft Corp. for 84 F-101B Voodoo jet interceptors, plus spare parts and ground servicing equipment.

The contract brings to \$355,795,-849 the total value of orders placed by USAF for the two-place F-101B. The plane flew initially a year ago and is scheduled to become operational in Air Defense Command this summer.

Kaman K-17 to fly soon

Kaman Aircraft Corp.'s company-financed Model K-17 two-place "cold jet" helicopter is scheduled to start flight tests by the end of this month. Air from a Boeing 502 compressor is ducted through rotor blades to nozzles at tips. Compressor is driven by a 400-hp Blackburn Turbomeca Turmo 600 turboshaft engine. Tail rotor is driven hydraulically.

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EN ROUTE

by Wayne W. Parrish

They've got some strange customs down under

HERE I WAS snoozing away in my darkened room in the Waterloo Hotel in Wellington, the capital of New Zealand, and somebody turned a key and barged into my room.

I awakened immediately and discovered the intruder to be a gal bringing in my morning tea. I asked quite imperiously in tones not designed to make for friendlier relations among people what she was doing breaking into my room in the middle of the night bringing some tea I hadn't ordered.

A glance at the clock indicated it was actually 6:30 a.m. but even so, it seemed like midnight. She said everyone gets tea unless orders are given to the contrary and I allowed as how this was a helluva social custom that could lead to dire political consequences and I wanted to sleep longer.

They have the damndest habits in some parts of the world. I've run into it in Africa, among other places. You lock your door from the inside on retiring and think you have privacy, when all the time some housemaid has a special key that undoes all your locking and in comes morning tea whether you want it or not.

I am quite appreciative of the fact that this time-honored English custom of early morning tea produces the desired and calculated result of regularity of bowel movement, but it is disconcerting to say the least, to be awakened at the early hour of 6:30 when you're trying to catch up on sleep. (In some African places the tea arrives at 6 o'clock.)

Anyway, after routing out the poor gal who was merely doing her duty, I got in some more sleep and then got up for an 8 a.m. breakfast.

I found that New Zealand and Australia have certain inflexible patterns in

their way of life. Take the simple matter of water faucets. Never in either country did I find a mixed hot and cold water faucet. Each was always separate and the hot water was usually scalding hot.

Now I'm one of those blokes who likes to mix the water and let it run while shaving. I don't run a basin full of water. I know this habit is wasteful but I'm a slothful creature and so I always found it difficult to perform my daily ablutions without being scalded. But somebody long ago decreed there would be two taps, one for hot, one for cold, and nobody in either country down there has had the courage to break with tradition and mix the two from a single spigot.

There is another thing I found in both countries, but especially in New Zealand. People are extremely frank in their questions and observations. I mean things of a personal nature.

For example one very nice lady watched me eat and when I finished she asked me how in the world I could get along eating the way I did, meaning the way I handled my knife and fork. Since I didn't eat in her fashion, I must be crazy, although this lady had never been out of her own country. I was so taken aback by this brash comment that all I could answer was that 160 million others in the U.S. eat that way and I never have had any trouble, as witness my plump condition.

I've done a fair mite of traveling about and in all sorts of circumstances including some pretty high living but this was the first time anybody I scarcely knew had criticized the way I handled my knife and fork. The English have their own quaint system but I've never thought of bringing that up to anybody and maybe I make a mess out of my table man-

ners, but dammit, they are standard mid-western U.S. manners and if they aren't correct by somebody else's standards, well, nuts, I ain't a-going to change.

But I did notice this frankness in those two "down under" countries which gave me a jolt occasionally. Others have confirmed that this is an Anzac trait the visitor must expect to take and put up with.

Now then, there's another thing that irked me. Breakfast was about the only meal I had at any time by myself. As at my own home, I like to read the paper leisurely and eat breakfast leisurely before getting on with the day's activities.

But in New Zealand you get regimented whether you like it or not. You're one of the mob at breakfast. They do everything but assign you a number. The breakfast procedure is enough to shake your morale for the rest of the day.

And so it was at the Waterloo. I looked forward to getting a paper and finding a small table and relaxing. Not so. As in all such hotel dining rooms there is a stuffy hostess, one of those brusque, cold, English types, who rushes you to a table already occupied by other people. She asks your room number and off to the races you go, painfully aware of the great organized breakfast bustle and noise which shatters one's nerves.

You join people who are gulping their food as though it were their last meal on earth. There are three times as many pieces of china and silver being crashed and clattered about than are needed for a good breakfast, all of the serving people rush about like automatons trying to set a new record, and if you weren't so hungry you could easily pass up the whole fantastic spectacle in favor of just a nice ordinary coffee shop down the street—but the latter doesn't exist down there.

For the life of me I don't know why in both New Zealand and Australia they mangle the breakfast hour in such a monstrous mass-production manner. It is impossible to get a table to yourself; at least I wouldn't have nerve to challenge those frustrated females who run the joints. It's the same many places in England, too. And breakfast can be the most pleasant meal of the day; at least it is with me, given half a chance. But you ain't got a chance, pal, in New Zealand.

Well, anyway, by the time I was through a breakfast of eggs and sausage and some under-par coffee, I heard myself being paged and went into the lobby to meet E. A. Gibson, the former director of civil aviation, who had wanted to see me. We had a good chat and along came D. A. Patterson, of New Zealand National Airways Corp., to take me to the airline offices for a lively and very informative coffee chat with the company officials. It was the beginning of a long and fascinating day. I had caught up on my sleep and was back in full form.



WWP with Miss Desna Douglas, managing editor of *Whites Aviation*, and Leo White, publisher, Auckland, N.Z.



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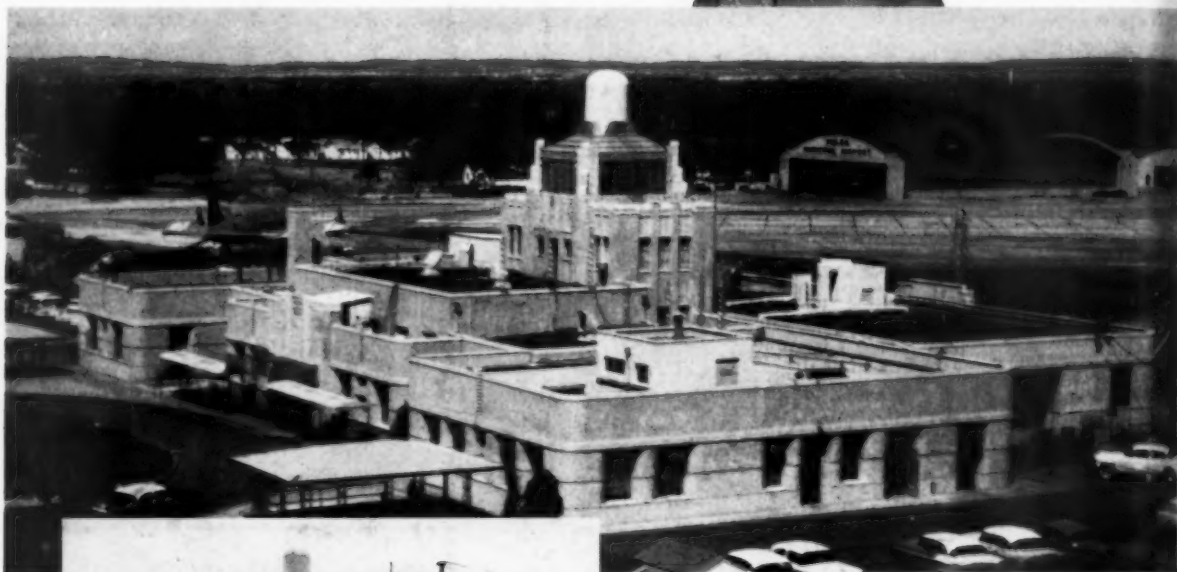
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